Vol. 1024 Number 4

OFFICIAL GAZETTE

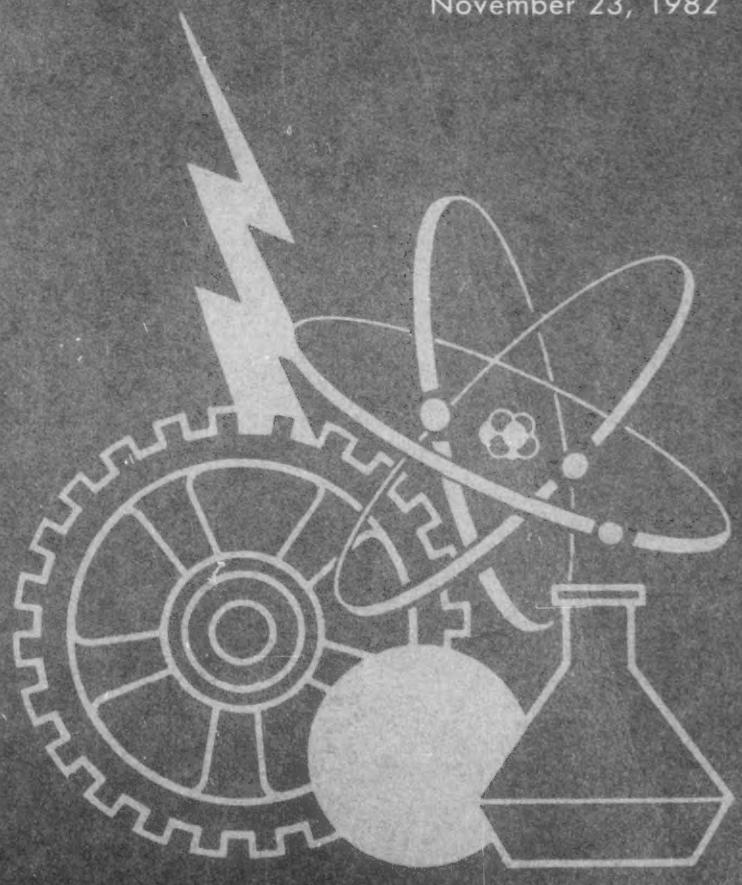
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

November 23, 1982



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 23, 1982 Volume 1024 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes, see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981. For use of the European Patent Office as a searching authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the international fees have been increased as of Jan. 1, 1982 and that the domestic PCT fees have been increased as of Oct. 1, 1982. Domestic PCT fees were increased by a rule change which was published at 1021 O.G. 11 on Aug. 10, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	710.00
International Fees	
Basic Fees (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation fee (for each national or regional office)	65.00

DONALD J. QUIGG,
Sept. 10, 1982. *Deputy Commissioner of Patents & Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,806,280, Re. S.N. 412,025, Filed Aug. 26, 1982, Cl. 417/222, FLUID DEVICE HAVING MEANS FOR ALIGNING A CYLINDER BARREL, Wilfred S. Bobier, Owner of Record: *The Oilgear Co., Milwaukee, Wis.,* Attorney or Agent: John G. Batchelder, Ex. Gp.: 343

3,868,889, Re. S.N. 412,879, Filed Aug. 30, 1982, Cl. 91/506, FLUID DEVICE HAVING MEANS FOR ALIGNING A CYLINDER BARREL, Wilfred S. Bobier, Owner of Record: *The Oilgear Co., Milwaukee, Wis.,* Attorney or Agent: John G. Batchelder, Ex. Gp.: 343

4,003,012, Re. S.N. 420,012, Filed Sept. 20, 1982, Cl. 335/213, VERTICAL COIL FOR A DEFLECTION YOKE, Bernard Chasens, Owner of Record: *General Instrument Corp., Clifton, N.J.,* Attorney or Agent: Robert L. Epstein, Ex. Gp.: 212

4,132,584, Re. S.N. 416,293, Filed Sept. 9, 1982, Cl. 156/500, MACHINE FOR MANUFACTURING FLAT-BOTTOMED BOTTLES, Samuel S. Aidlin, et al., Owner of Record: *Inventors,* Attorney or Agent: Erwin S. Teltscher, Ex. Gp.: 161

4,199,606, Re. S.N. 421,125, Filed Sept. 22, 1982, Cl. 426/330.6, PROPIONIC ACID ON A CARRIER MATERIAL AS A PRESERVATIVE, Bobby J. Bland, Owner of Record: *Inventor,* Attorney or Agent: Robert E. Richards, et al., Ex. Gp.: 172

4,201,825, Re. S.N. 414,742, Filed Sept. 3, 1982, Cl. 428/263, METALLIZED TEXTILE MATERIAL, Harold Ebneth, Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 164

4,221,747, Re. S.N. 416,089, Filed Sept. 8, 1982, Cl. 261/44B, CARBURETOR, William H. Edmonston, Owner of Record: *Inventor,* Attorney or Agent: Frank P. Presta, et al., Ex. Gp.: 177

4,223,762, Re. S.N. 420,135, Filed Sept. 20, 1982, Cl. 188/269, OMNIDIRECTIONAL VIBRATION ISOLATING, Maurice Gertel, Owner of Record: *Inventor,* Attorney or Agent: Charles Hieken, Ex. Gp.: 314

4,240,145, Re. S.N. 416,162, Filed Sept. 9, 1982, Cl. 364/431, CLOSED LOOP CONTROLLED AUXILIARY AIR DELIVERY SYSTEM FOR INTERNAL COMBUSTION ENGINE, Tsuneomi Yano, et al., Owner of Record: *Nissan Motor Co., Ltd., Yokohama City, Japan,* Attorney or Agent: Arthur Schwartz, et al., Ex. Gp.: 237

4,278,981, Re. S.N. 416,838, Filed Sept. 13, 1982, Cl. 346/108, OPTICAL PRINTER, Bernhard Hill, et al., Owner of Record: *U.S. Philips Corp., New York, N.Y.,* Attorney or Agent: Thomas A. Briody, Ex. Gp.: 211

4,279,306, Re. S.N. 414,619, Filed Sept. 3, 1982, Cl. 166/312, WELL WASHING TOOL AND METHOD, Robert D. Weitz, Owner of Record: *Top Tool Co., Inc., Houma, La.,* Attorney or Agent: Bill B. Berryhill, Ex. Gp.: 356

4,281,664, Re. S.N. 399,638, Filed July 19, 1982, Cl. 128/696, IMPLANTABLE TELEMETRY TRANSMISSION SYSTEM FOR ANALOG AND DIGITAL DATA, Stephen R. Duggan, Owner of Record: *Medtronic, Inc., Minneapolis, Minn.,* Attorney or Agent: None, Ex. Gp.: 335

4,290,447, Re. S.N. 409,565, Filed Aug. 19, 1982, Cl. 137/596.2, ELECTROHYDRAULIC PROPORTIONAL VALVE, Dale Knutson, Owner of Record: *Dynex/Rivett, Inc., Pewaukee, Wis.,* Attorney or Agent: John J. Byrne, et al., Ex. Gp.: 341

4,299,512, Re. S.N. 393,376, Filed June 29, 1982, Cl. 403/357, MEANS FOR YIELDABLY COUPLING A SHAFT TO COUNTER WHEELS OR THE LIKE, Friedemann Wagner, Owner of Record: *Inventor,* Attorney or Agent: Peter Kontler, Ex. Gp.: 351

4,310,287, Re. S.N. 409,482, Filed Aug. 19, 1982, Cl. 419/54, METHOD AND APPARATUS FOR OPERATING A WATER-JET PUMP, Siegfried Heilenz, Owner of Record: *Inventor,* Attorney or Agent: David G. Boutell, Ex. Gp.: 343

4,319,610, Re. S.N. 419,035, Filed Sept. 16, 1982, Cl. 138/131, PROCESS FOR COATING METAL TUBES AND USE OF THE COATED TUBES, Gunter Eckner, Owner of Record: *Hoechst Aktiengesellschaft, Frankfurt am main, Germany,* Attorney or Agent: Charles A. Muserlian, Ex. Gp.: 243

4,333,470, Re. S.N. 411,950, Filed Aug. 26, 1982, Cl. 128/419PG, OUTPUT PULSE ARTIFACT REJECTION IN DEMAND PACEMAKERS, Thomas C.

Barthel, Owner of Record: *Inventor,* Attorney or Agent: Glenn W. Bowen, Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,962,136, Reexam. No. 90/000,275, Requested: Oct. 18, 1982, Cl. 252/454, CATALYST FOR PRODUCTION OF ETHYLENE OXIDE, Robert P. Nielsen, et al., Owner of Record: *Shell Oil Co., Houston, Tex.,* Attorney or Agent: Howard W. Haworth, et al., Ex. Gp.: 116, Requester: Charles B. Rodman, White Plains, N.Y.

4,011,665, Reexam. No. 90/000,277, Requested: Oct. 18, 1982, Cl. 434/410, DEVICE FOR PROVIDING A SEMI-PERMANENT LUMINESCENT DISPLAY, Lillian Port, Owner of Record: *Inventor,* Attorney or Agent: Friedman, Goodman & Teitelbaum, Ex. Gp.: 334, Requester: Benjamin Kinberg, New York, N.Y.

4,219,333, Reexam. No. 90/000,272, Requested: Oct. 19, 1982, Cl. 8/137, CARBONATED CLEANING SOLUTION, Robet D. Harris, Owner of Record: *Harris Research, Inc., Sacramento, Calif.,* Attorney or Agent: M. Wayne Western, Ex. Gp.: 140, Requester: Jerry Salomone, Edison, N.J.

4,229,211, Reexam. No. 90/000,274, Requested: Oct. 19, 1982, Cl. 75/46, LADLE HEATING SYSTEM, Donald D. Battles, Owner of Record: *The Cadre Corp., Atlanta, Ga.,* Attorney or Agent: George M. Thomas, Ex. Gp.: 110, Requester: Owner of Record

4,237,064, Reexam. No. 90/000,276, Requested: Oct. 18, 1982, Cl. 260/459A, PROCESS FOR PREPARING QUATERNARY AMMONIUM COMPOSITIONS, Richard A. Reck, Owner of Record: *Akzona, Inc., Asheville, N.C.,* Attorney or Agent: Robert F. Green, Ex. Gp.: 120 Requester: Owner of Record

4,266,976, Reexam. No. 90/000,270, Requested: Oct. 4, 1982, Cl. 106/2, FABRIC TREATING COMPOSITIONS, Razmic S. Gregorian, et al., Owner of Record: *United Merchants & Manufacturers, New York, N.Y.,* Attorney or Agent: Michael A. Caputo, Ex. Gp.: 140, Requester: Dexter Chemical Corp., Bronx, N.Y.

Request for Refunds

In order to expedite the processing of refunds for payment of fees by actual mistake or in excess of the designated fees, attorneys and applicants requesting refunds should direct their correspondence to the attention of the "Refund Section, Accounting Division, Office of Finance." This procedure should be followed whether the request is for a refund check or for a credit to the deposit account. The problems of misrouting the request for a refund in the Patent and Trademark Office would be alleviated and the payment of refunds accelerated.

BRADFORD R. HUTHER,
Assistant Commissioner
for Finance & Planning.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 1
[Docket No. 21001-201]
File Wrapper Continuing Application Procedure

AGENCY: Patent and Trademark Office, Commerce.
ACTION: Final rule.

SUMMARY: The Patent and Trademark Office is amending the rules of practice in patent cases to provide a new procedure for filing continuation, continuation-in-part, and divisional patent applications. This procedure is being provided to simplify filing and processing of continuation, continuation-in-part and divisional patent applications which have heretofore required a new set of application papers. By using the application which is to be abandoned, the procedure will eliminate many of the problems currently involved in preparing and processsing such continuing patent application papers.

EFFECTIVE DATE: Feb. 27, 1983.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: The Patent and Trademark Office is amending the rules of practice for patent cases to permit an applicant to file a continuation or division of a pending patent application by simply filing a request therefor and paying the necessary application filing fee. To file a continuation-in-part application, an amendment adding the additional subject matter and an oath or declaration relating thereto is also required.

The "file wrapper continuing" (FWC) procedure is incorporated in the rules by adding a new §1.62. Under this simplified procedure, any continuing application such as a continuation, continuation-in-part, or divisional application may be filed by using the papers in the copending prior application, which application will become automatically expressly abandoned. Under the FWC procedure, a new serial number is assigned and the specification, drawings and other papers in the parent application file wrapper are used as the papers in the continuing application. Changes in inventorship may be made. The "file wrapper continuing" (FWC) procedure is available for utility, design, plant, and reissue applications to the full extent that continuing applications can now be filed in such applications. Use of the FWC procedure will automatically result in express abandonment of the prior application as of the date that the continuation, continuation-in-part, or divisional application is filed.

The FWC procedure could be used for any continuation, continuation-in-part or divisional application provided the applicant wishes the copending prior application to become abandoned. If a divisional application is desired without abandonment of the parent application, the procedure under §1.60 should be used. Applicant also has the option of filing new application papers with a reexecuted oath or declaration.

Background

The notice of proposed rulemaking was published in the Federal Register on Nov. 7, 1980 at 45 FR 73965 and in the Official Gazette on Dec. 9, 1980 at 1003 O.G. 9. An oral hearing was held on Feb. 4, 1981.

Discussion of Major Issue Involved

A continuation or divisional application is an application in which the disclosure is identical to an earlier application. However, the claims may be changed. Continuation applications are often filed in situations where the applicant feels that the issue of patentability has not been satisfactorily resolved before the examiner and the application is not in condition for an appeal from the final rejection to the Board of Appeals. Divisional applications are filed voluntarily or as a result of a requirement for restriction by the examiner in a prior application. Continuation-in-part applications are filed where additional subject matter is added and claimed in the application. Under 35 U.S.C. 120 of the patent law, a continuation, continuation-in-part or divisional application may be filed during the pendency of the prior application and

the benefit of the filing date of the prior application for the subject matter disclosed therein may be obtained.

The practice under §1.60 has resulted in a number of problems, especially difficulties in obtaining good-quality copies of prior applications. In addition, the practice involves unnecessary handling and processing delays.

Under new §1.60, the specification, claims and drawings, and any amendments in the prior application are made available for use in the continuation, continuation-in-part, or divisional application. A new filing fee is required in accordance with 35 U.S.C. 41 and 37 CFR 1.16. The only other statutory requirement under 35 U.S.C. 111 is a signed oath or declaration. Since a continuation or divisional application cannot contain new matter, the oath or declaration filed in the prior application would supply all the information required under the statute and rules to have a complete application and to obtain a filing date. Accordingly, the previously-filed oath or declaration will be considered to be the oath or declaration of the §1.62 continuation or division. However, if a continuation-in-part application is being filed, or a correction of inventorship is being made, then a new oath or declaration must be signed and filed by the applicant.

The original disclosure of an application filed under §1.62 will be the original parent application as executed by the inventor(s). However, the filing fee will be based on the claims in the §1.62 application after entry of any unentered amendments under §1.116 in the prior application and any preliminary amendment which may accompany the FWC request and filing fee. The Certificate of Mailing Procedure under 37 CFR 1.8 will not apply to filing a request for a "File Wrapper Continuing" application since the filing of such a request is considered to be a filing of application papers for the purpose of obtaining an application filing date (37 CFR 1.8(a)(i)).

The applicant may file a signed FWC request and the regular filing fee under §1.16 and other necessary papers with the Patent and Trademark Office, either by mail addressed to "Box FWC" or in person with the mail room. An individual check or deposit account authorization should accompany each FWC application, since combined checks delay processing.

The Correspondence and Mail Division will sort out all "Box FWC" envelopes upon receipt and deliver them to a reader for prompt special handling. The reader would apply the "Mail Room" date stamp and mark the categories of the fees. The papers for each FWC application would be assigned a regular national serial number and be placed in a "Jumbo" size file wrapper. The Special Handling Branch will review the FWC request for accuracy and completeness and assign the filing date if everything appears to be in order. Problems will be handled, insofar as possible, by calling the applicant or attorney by telephone. There will be no need for any processing of the FWC application by the Classification or Examination Branches of Application Division since there are no papers to be examined and the FWC application will be routed to the group assigned the prior application. When the FWC application file wrapper is received in the examining group, the parent application will be promptly obtained and processed by a clerical staff member.

All of the correspondence from the Office in a FWC application will refer to the FWC application serial number and filing date and will be processed in the same manner as any other continuation, continuation-in-part or divisional application. The first action final rejection procedures set forth in §706.07(b) of the Manual of Patent Examining Procedure will also apply to FWC applications filed under §1.62.

The PALM III system will supply information to authorized persons as to the location of the parent application file wrapper and will tie the parent application number to the FWC application number.

The provisions of §1.62 provide that if any application in the file wrapper is available to the public that all applications in the file wrapper will be available to the public.

Some of the anticipated benefits of the new §1.62 procedure are the following:

For the Applicant

1. Formal requirements will be minimal.

2. A more prompt first action in the continuing application should be received in view of reduced processing time. The Application Division can process promptly all §1.62 applications with minimal effort. In the examining groups, the applications will be given high priority for processing purposes.

3. Amendments made to the specification, drawings and claims of the prior application will carry over into the §1.62 continuing application and will not need to be resubmitted in the continuing application.

For the Public

1. The pendency of a series of applications should be reduced since the time delay before examination and issuance of a continuing application filed under the §1.62 procedure would be reduced.

2. The entire record of prosecution could be in one file wrapper under the §1.62 procedure, even if several continuing applications are filed. This will result in easier access by the pubic to a series of applications if a patent is later issued.

For the Patent and Trademark Office

1. The workload of reviewing and processing new application papers in the Application Division will be reduced.

2. The examining group clerks will not be required to again enter amendments made in the prior application.

3. Less storage space will be required under §1.62 since there will be fewer papers to store.

4. The prior application file history and references cited therein will be readily available to the examiner under §1.62 and will not need to be ordered from abandoned files.

5. The Office will not be required to prepare a copy of the prior application file under the §1.62 procedure.

Discussion of Comments Received

After careful consideration of the comments which have been received, the proposed rulemaking relating to file wrapper continuing application procedure is being adopted with certain changes. A total of 23 comment letters were received. Six of these letters were received from patent law organizations. Two persons presented oral comments at the hearing. The comments of 6 letters supported the proposed rulemaking without further suggestions for change. Only one letter opposed the proposal.

Seven of the letters urged adoption of a procedure whereby an applicant could pay a fee to have a final rejection withdrawn so that prosecution could be extended in an application rather than filing a continuing application. This suggestion was not adopted for several reasons. Such a procedure could not be used for filing of continuation-in-part applications, the average pendency of applications in the Office would be extended, and significant problems in internal record systems would be created.

A number of comments were received which presented specific suggestions to proposed §1.62. Four letters commented that the requirement of proposed §1.62(a)(4) to supply information as to title, applicant, correspondence address, etc. in order to file under §1.62 could easily lead to filing errors.

In final §1.62(a)(3) only the serial number, filing date and applicant's name of the prior application are required. The filing of information relating to the title, applicant's name, etc. is however urged in paragraph (e) of final §1.62 and is needed to prepare Office records and the filing receipt.

One comment letter was received which indicated that a specific reference should be made to unentered amendments filed under 37 CFR 1.116. Such a reference has been added to paragraph (a)(2) of §1.62.

Two letters objected to the requirement in proposed §1.62(a)(2) that a new set of claims be presented. This requirement has been deleted from final §1.62.

A number of general comments were also presented relating to §1.62. One comment argued that the proposed practice would encourage abuse by examiners of the second action final rejection practice. In response to this argument, it is felt that the proposed procedure would not create any new problems.

One comment indicated that problems involving access to the file wrapper may arise. It is felt, however, that access problems should not arise in view of paragraph (c) of final §1.62 which relates to waiver of secrecy. The current PALM III computer record system is capable of indicating the location of both the prior and continuing applications.

One comment was received relating to proposed § 1.138 which indicated that the reference to §1.60 was confusing. The reference to §1.60 has been deleted in final §1.138.

New §1.62 sets forth the requirements of the file wrapper continuing procedure.

Section §1.138 is amended so that a registered attorney or agent could, without being of record, file a §1.62 application and expressly abandon a pending prior application. Such an action would not affect applicant's rights to any great extent since the prior application would only be expressly abandoned if a filing date was granted to a continuing application.

Other Considerations

Environmental, Energy, and Other Considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980(44 U.S.C. 3501 et seq.).

The rule change will not have a significant adverse economic impact on a substantial number of small entities because it adds no burdens and does simplify filing procedures (Regulatory Flexibility Act, Pub. L. 96–354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to preparing application papers and amendments, will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Lawyers.

PART 1—[AMENDED]

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by Section 6 of Title 35 of the United States Code, Part 1 of Title 37 of the Code of Federal Regulations is amended as set forth below.

1. A new §1.62 is added to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application which uses the specification and drawings from a prior application may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on a prior application if each of the following four conditions are met:

(1) A request is made for filing under this section;

(2) The filing fee for a continuation, continuation-in-part, or divisional application is paid. Such filing fee must be based on the number of claims remaining in the application after entry of any preliminary amendment and any repeated amendment under §1.116 unentered in the prior application;

(3) The prior application is identified by Serial Number, filing date, and applicant's name;

(4) In the case of a continuation-in-part which adds additional disclosure, a new oath or declaration must also be filed as provided by 35 U.S.C. 111. In a continuation or divisional application which discloses and claims only subject matter disclosed in a prior application, no additional oath or declaration is required.

(b) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application serial number.

(c) The filing of an application under this section will be construed to include a waiver of secrecy by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 CFR 1.14 to access to, or information concerning, either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

(d) The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application.

(e) The applicant is urged to furnish the following information relating to the prior application to the best of his or her ability:

(1) Title as originally filed and as last amended;

(2) Name of applicant as originally filed and as last amended;

(3) Current correspondence address of applicant;

(4) Identification of prior foreign application and any priority claim under 35 U.S.C. 119.

(f) Envelopes containing only application papers and fees for filing under this section should be marked "Box FWC".

2. Section 1.138 is revised to read as follows:

§1.138 Express abandonment.

An application may be expressly abandoned by filing in the Patent and Trademark Office a written declaration of abandonment signed by the applicant himself or herself, and the assignee of record, if any, identifying the application. Except as provided in §1.262 an application may also be expressly abandoned by filing a written declaration of abandonment signed by the attorney or agent of record. A registered attorney or agent acting under the provision of §1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application. Express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue.

Sept. 30, 1982.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[FR Doc. 82-29283 Filed 10-23-82; 8:45 am]
BILLING CODE 3510-16-M

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 21001–200]
Court Review of Patent and Trademark Office Decisions

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: The Patent and Trademark Office is amending its rules of practice relating to court review of its decisions. The Federal Courts Improvement Act of 1982, Pub. L. 97-164, established the United States Court of Appeals for the Federal Circuit (CAFC), effective Oct. 1, 1982, and transferred to this Court the jurisdiction previously vested in the U.S. Court of Customs and Patent Appeals to review Patent and Trademark Office decisions. This rulemaking action substitutes the name of the new Court where the predecessor U.S. Court of Customs and Patent Appeals is referred to in the rules, and changes Office procedures to conform to the requirements of the new Court's rules.

EFFECTIVE DATE: Oct. 26, 1982.

FOR FURTHER INFORMATION CONTACT: Joseph F. Nakamura by telephone at (703) 557-3525 or by mail marked to his attention and addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION:

The Rule Changes

The Patent and Trademark Office has found that the provisions of the Administrative Procedure Act (5 U.S.C. 553) requiring notice of proposed rulemaking, opportunity for public participation, and delay of effective date are not applicable because they are unnecessary. The rule changes can have no substantive impact on the rights and duties of persons subject to the rules. These changes simply conform Office practice to the agency procedures required by the "Rules of the United States Court of Appeals for the Federal Circuit." These rules have already been issued, distributed and scheduled to go into effect on Oct. 1, 1982. They can be changed only by the Court and are binding on the Office. The substitution of the name of the new Court for the prior Court's name is a housekeeping, and not a substantive, change to conform the rules to a change made by Pub. L. 97-164.

The Federal Courts Improvement Act of 1982, Pub. L. 97-164, established the United States Court of Appeals for the Federal Circuit and transferred to this Court the jurisdiction previously vested in the U.S. Court of Customs and Patent Appeals to review Patent and Trademark Office decisions. The rules in Parts 1 and 2 of Title 37, Code of Federal Regulations, in which the U.S. Court of Customs and Patent Appeals is named are accordingly being amended by substituting the name of the new Court. The rules so amended are §§1.8, 1.253(e), 1.301, 1.302, 1.303, 1.304 and 2.145.

The "Rules of the United States Court of Appeals for the Federal Circuit" specify that the Commissioner, upon receipt of an appellant's notice of appeal to the Court "shall promptly transmit to the clerk of this court a certified list as described in FRAP 17(b), which shall constitute compliance with the requirement of 35 U.S.C 143 and 15 U.S.C. 1071(a)(3) for the transmission of a certified record to the Court." Sections 1.301 and 2.145 accordingly are being amended by deleting references to the transmission of a certified transcript of record by the Office to the Court on order of and at the expense of the appellant. Reference is being made instead to the certified list required by the new Court's rules.

The rules of the new Court require all appendices to be 8½ by 11 inches in size with type matter 6½ by 9½ inches. Accordingly, the alternative smaller page size permitted by section 253(e) for copies of testimony is being eliminated. The provision for allowing twenty-five additional copies of the testimony to be filed for use if an appeal is taken is also being eliminated since the transmission of a record to the Court is not required under the new Court's rules.

In addition to the above-noted changes, housekeeping changes are being made as follows.

In §1.8(a), a reference to §§3.55 and 4.23 is being deleted since these sections are being deleted effective Oct. 1, 1982. In §§1.302, 1.304 and 2.145, references to the masculine gender are being amended to include the feminine.

Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*).

The rule change will not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act). If anything, the change will reduce costs for persons, including small businesses, who appeal to the new Court from Patent and Trademark Office decisions. A Regulatory Flexibility Analysis, therefore, will not be prepared.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291 because it does not result in: (a) An effect on the economy of $100 million or more, (b) a major increase in any costs or prices, or (c) adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete domestically or abroad with foreign-based enterprises.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C 3501 *et seq.* since no additional recordkeeping or reporting requirements are placed upon the public.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Courts, Inventions and patents, Trademarks.

Amendment of Regulations

For the reasons given above, and pursuant to the authority of the Commissioner of Patents and Trademarks under 35 U.S.C. 6 and 15 U.S.C. 1123, Parts 1 and 2 of Title 37, Code of Federal Regulations, are amended as set forth below.

PART 1—RULES OF PRACTICE IN PATENT CASES

1. Section 1.8 is amended by revising paragraph (a)(1), (a)(2) and (a)(2)(viii) to read as follows:

§1.8 Certificate of mailing.

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if: (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the U.S. Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated, the actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

* * * * *

(viii) The filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Appeals for the Federal Circuit.

* * * * *

2. Section 1.253 is amended by revising paragraph (e) to read as follows:

§1.253 Copies of the testimony.

* * * * *

(e) When the copies of the testimony are submitted in printed form, they may be produced by standard typo-

graphic printing or by any process capable of producing a clear black permanent image. All printed matter except on covers must appear in at least 11 point type on opaque, unglazed paper. Margins must be justified. Footnotes may not be printed in type smaller than 9 point. The page size shall be 8½ by 11 inches (21.8×27.9 cm.) with type matter 6½ by 9½ inches (16.5×24.1 cm.). The testimony shall be bound to lie flat when open.

* * * * *

3. Section 1.301 is amended by revising the section and section heading to read as follows:

§1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Appeals, and any party to an interference dissatisfied with the decision of the Board of Patent Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office give notice to the Commissioner and file the reasons of appeal (see §§1.302 and 1.304); (b) in the court, file a copy of the notice and reasons of appeal and pay the fee for appeal, as provided by the rules of the court. The certified list required by the rules of the Court will be transmitted to the Court by the Patent and Trademark Office.

4. Section 1.302 is amended by revising paragraph (a) to read as follows:

§1.302 Notice and reasons of appeal.

(a) When an appeal is taken to the U.S. Court of Appeals for the Federal Circuit, the appellant shall give notice thereof to the Commissioner, and file in the Patent and Trademark Office within the time specified in §1.304, his or her reasons of appeal specifically set forth in writing.

* * * * *

5. Section 1.303 is amended by revising the section to read as follows:

§1.303 Civil action under 35 U.S.C. 145, 146, 306.

(a) Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Appeals, and any party dissatisfied with the decision of the Board of Patent Interferences, may, instead of appealing to the U.S. Court of Appeals for the Federal Circuit (§1.301), have remedy by civil action under 35 U.S.C. 145 or 146, as appropriate. Such civil action must be commenced within the time specified in §1.304.

(b) If an applicant in an ex parte case or an owner of a patent involved in a reexamination proceeding has taken an appeal to the U.S. Court of Appeals for the Federal Circuit, he or she thereby waives his or her right to proceed under 35 U.S.C. 145.

(c) If any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an interference proceeding files notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (§1.302), that he or she elects to have all further proceedings conducted as provided in 35 U.S.C. 146, certified copies of such notices will be transmitted to the U.S. Court of Appeals for the Federal Circuit for such action as may be necessary. The notice of election must be served as provided in §1.248.

6. Section 1.304 is amended by revising paragraphs (a) and (c) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time specified in § 1.197(b) or §1.256(b), or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

* * * * *

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 that he or she elects to have all further proceedings conducted under 35 U.S.C. 146 (§1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141.

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

7. Section 2.145 is amended by revising the section to read as follows:

§2.145 Appeal to court and civil action.

(a) *Appeal to U.S. Court of Appeals for the Federal Circuit.* An applicant for registration, or any party to an interference, opposition, or cancellation proceeding or any party to an application to register as a concurrent user, hereinafter referred to as inter partes proceedings, who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under section 8 of the Act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§2.165, 2.184), may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section); (2) In the court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court. The certified list required by the rules of the Court will be transmitted to the Court by the Patent and Trademark Office.

(b) *Notice of appeal.* (1) When an appeal is taken to the U.S. Court of Appeals for the Federal Circuit, the appellant shall give notice thereof in writing to the Commissioner, which notice shall be filed in the Patent and Trademark Office, within the time specified in paragraph (d) of this section. The notice shall specify the party or parties taking the appeal and shall designate the decision or part thereof appealed from.

(2) In inter partes proceedings, the notice must be served as provided in §2.119.

(c) *Civil Action.* (1) Any person who may appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (a) of this section), may have remedy by civil action under section 21(b) of the Act. Such civil action must be commenced within the time specified in paragraph (d) of this section.

(2) If an applicant or registrant in an ex parte case has taken an appeal to the U.S. Court of Appeals for the Federal Circuit, he thereby waives his right to proceed under section 21(b) of the Act.

(3) If any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding files notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), that he or she elects to have all further proceedings conducted as provided in section 21(b) of the Act, certified copies of such notices will be transmitted to the U.S. Court of Appeals for the Federal Circuit for such action as may be necessary. The notice of election must be served as provided in §2.119.

(d) *Time for appeal or civil action.* (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is sixty days from the date of the decision of the Trademark Trial and Appeal Board or the Commission-

er, as the case may be. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time specified in §2.129(c) or §2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

(2) The times specified herein are calendar days. If the last day of time specified for an appeal, or commencing a civil action falls on a Saturday, Sunday or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under section 21(a)(1) of the Act that he or she elects to have all further proceedings conducted under section 21(b) of the Act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the Act.

GERALD J. MOSSINGHOFF,

Oct. 1, 1982. *Commissioner of Patents and Trademarks.*

[FR Doc 82-29287 Filed 10-25-82; 8:45 am]

BILLING CODE 3510-16-M

PATENT NOTICES

Certificates of Correction for the Week of Nov. 23, 1982

D. 264,502	4,299,012	4,325,104	4,344,036
3,542,056	4,299,220	4,325,164	4,344,629
3,942,372	4,301,119	4,326,509	4,345,300
3,964,084	4,301,577	4,326,950	4,345,510
4,007,094	4,301,814	4,327,778	4,345,807
4,101,457	4,302,375	4,329,173	4,345,934
4,130,974	4,302,440	4,329,347	4,346,385
4,141,494	4,302,704	4,331,528	4,346,600
4,142,571	4,304,722	4,331,856	4,346,770
4,197,430	4,304,930	4,332,889	4,347,354
4,204,067	4,305,362	4,333,052	4,347,396
4,206,131	4,309,537	4,333,684	4,347,723
4,207,982	4,311,681	4,333,963	4,347,758
4,223,372	4,311,967	4,334,250	4,347,810
4,239,852	4,312,398	4,334,976	4,348,369
4,240,077	4,312,746	4,335,116	4,348,679
4,242,043	4,315,262	4,335,360	4,348,915
4,250,075	4,315,348	4,336,129	4,349,242
4,261,933	4,315,670	4,336,364	4,349,830
4,262,055	4,315,691	4,338,204	4,349,904
4,265,294	4,316,151	4,339,473	4,349,906
4,266,748	4,320,805	4,340,859	4,350,243
4,270,974	4,321,373	4,342,820	4,350,743
4,272,511	4,322,179	4,343,082	4,350,922
4,273,860	4,322,843	4,343,368	4,351,920
4,290,593	4,323,637	4,343,543	4,351,967
4,293,726	4,324,173	4,343,656	4,352,105
4,298,583	4,324,501	4,343,740	4,352,584
4,298,744	4,324,696	4,343,767	4,353,036

Disclaimers

4,065,589.—*William Lenard,* Temperance, Mich. and *Lynn J. Taylor,* Toledo, Ohio. POLYMERIC COATING FOR PROTECTION OF GLASS SUBSTRATE. Patent dated Dec. 27, 1977. Disclaimer filed July 19, 1982, by the assignee, *Owens—Illinois, Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,327,792.—*Samuel P. Landers,* Uniontown, Ohio. SPREADING NOISE GENERATED BY LOAD SUPPORTING ELEMENTS. Patent dated May 4, 1982. Disclaimer filed Sept. 2, 1982, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby enters this disclaimer to claims 1, 2, 3, 22, 24, 25, 33, 36, 38, 40, 41 and 49 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4559
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 16, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-12-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-13-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-27-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-18-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	9-08-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-02-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-24-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	2-02-80
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	10-20-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-01-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	2-06-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-22-80

Expiration of patents: The patents within the range of numbers indicated below expire during October 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,209,369 to 3,214,766, inclusive

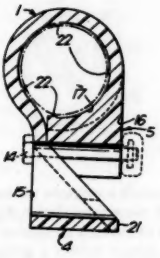
Plant Patents ..... Numbers 2,558 to 2,565 inclusive

REEXAMINATIONS

NOVEMBER 23, 1982

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 4,240,184 (34th)
PIPE AND CABLE CLAMPS
Peter Delhees, Liverpool; John P. Conlan, Chester, both of England, assignors to BICC Limited, London, England.
Reexamination Request No. 90/000,134, Dec. 23, 1981.
Reexamination Certificate for Patent No. 4,240,184, issued Dec. 23, 1980, Ser. No. 957,027, Nov. 2, 1978.
Int. Cl.³ B65D 63/00. *F16L 33/04, 47/00*
U.S. Cl. 24/279



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2 and 5 are determined to be patentable as amended.

Claims 3, 4 and 6, dependent on amended claims, are determined to be patentable.

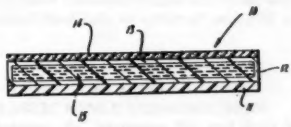
2. A support clamp including a flexible member and *at the ends thereof* fittings, integral with the flexible member or permanently attached to it, such that when the clamp is wrapped round a cable it can be secured and supported by means of said end-fittings *with both substantially the whole length of said flexible member and also one said end-fitting in direct contact with said cable*, each said end-fitting having a planar faying surface which faying surfaces (i) are non-radial to the cable to a substantial degree when the clamp is wrapped round a circular cable with a circumference in a predetermined range; (ii) engage one another in relative positions that differ by displacement in the plane normal to the cable axis dependent on the magnitude of the circumference within that range; [and] (iii) *extend* [extends] substantially from end to end of each said end-fitting in the direction of said displacement; *(iv) have apertures for receiving a fixing screw that extends through said faying surfaces and (v) are inclined to said screw in the direction such that pressure from the screw tends to displace the end-fittings in the tightening direction.*

B1 3,598,122 (35th)
BANDAGE FOR ADMINISTERING DRUGS
Alejandro Zaffaroni; Atherton, Calif.; assignor to Ciba-Geigy Limited, Basel, Switzerland
Reexamination Request No. 90/000,107, Nov. 12, 1981.
Reexamination Certificate for Patent No. 3,598,122, issued Aug. 10, 1971, Ser. No. 812,116, Apr. 1, 1969.
U.S. Cl. 128/268 **Int. Cl.³ A61F** *7/02*

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

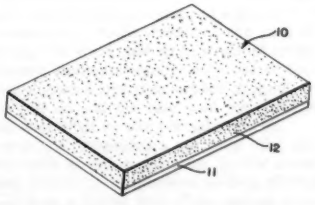
The patentability of claims 1-15 is confirmed.

1. A medical bandage for use in the continuous administration to circulation of controlled quantities of systemically active drugs over a prolonged period of time by absorption through the external body skin or mucosa,



said bandage comprising a sandwich including (1) a backing member; (2) a discrete, middle reservoir layer containing a systemically active drug, which reservoir layer is comprised of systemically active drug formulation confined within a wall member, said wall member being formed from drug release rate controlling material to continuously meter the flow of drug from the said reservoir to the skin or mucosa at a controlled and predetermined rate over a prolonged period of time; and (3) a surface of a pressure-sensitive adhesive adapted for contact with the skin or mucosa of a patient.

B1 3,742,951 (36th)
BANDAGE FOR CONTROLLED RELEASE OF VASODILATORS
Alejandro Zaffaroni, Atherton, Calif., assignor to Ciba-Geigy Limited, Basel, Switzerland
Reexamination Request No. 90/000,108, Nov. 12, 1981.
Reexamination Certificate for Patent No. 3,742,951, issued Jul. 3, 1973, Ser. No. 169,977, Aug. 9, 1971.
U.S. Cl. 128/268 **Int. Cl.³ 61F** *7/02*



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-19 is confirmed.

1. A medical bandage for the continuous administration

to the skin or mucosa of controlled quantities of systemically active vasodilator drugs over a prolonged period of time by absorption through the external body skin or mucosa, said bandage comprising a laminate of (1) a backing member defining one face surface of the bandage, (2) a pressure-sensitive adhesive adapted for contact with the skin or muscosa, the external surface of said pressure-sensitive adhesive defining the other face surface of the bandage and, disposed between the face surfaces defined by (1) and (2), (3) at least one reservoir comprised of a systemically active vasodilator drug formulation confined within a wall member, said wall member being formed from drug release rate controlling material to continuously meter the flow of drug from the said reservoir to the skin or mucosa at a controlled and predetermined rate over a prolonged period of time.

REISSUES

NOVEMBER 23, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,084
SWAGING DIES

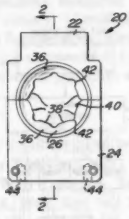
Cedric G. Birks, 13 Northwood Park, Leeds, West Yorkshire, England

Original No. 4,067,224, dated Jan. 10, 1978, Ser. No. 710,815, Aug. 2, 1976. Application for reissue May 3, 1979, Ser. No. 35,572

Claims priority, application United Kingdom, Aug. 4, 1975, 32601/75

Int. Cl.³ B21J *13/02;* **B21D** *37/10*

U.S. Cl. 72—416 **6 Claims**



1. For use in a press for swaging a sleeve onto a bar a pair of coacting high strength metal *compression* dies, each of said dies comprising a recess extending parallel to the longitudinal axis of said bar [and having a ribbed medial portion including]. *said recess including a medial portion of uniform size and shape extending along its entire length, the surface of the medial portion of the recess being in the form of* a plurality of radially projecting ribs extending along said axis, said ribs projecting [upward] *radially inward* from said [recess], *surface* with the recess portions *of said recess* between immediately adjacent ribs being concavely relieved, the ribs being so located that when said dies are in contact with each other their [recesses] *medial recess portions* conjoin to form a polygonal opening *of uniform profile along its length,* with the concave relieved portions of the dies equidistantly spaced about the periphery of said polygonal opening, *said dies being arranged to be brought together in a radial direction by said press, with said sleeve and said bar disposed therebetween to compress the sleeve onto the bar* so that [upon swaging] the material of the sleeve adjacent each of said concave relieved portions conveniently flows into said relieved portions.

Re. 31,085
COIN CHUTE TO ACCOMMODATE VARIOUS COIN SLIDES HAVING DIFFERENTLY SIZED COINS AND COIN COMBINATIONS.

Harry Greenwald, Whitestone, and Christos Lambiris, New York, both of N.Y., assignors to Kidde, Inc., Clifton, N.J.

Original No. 4,221,285, dated Sep. 9, 1980, Ser. No. 952,124, Oct. 17, 1978. Application for reissue Mar. 23, 1981, Ser. No. 246,646

Int. Cl.³ G07F *5/08*

U.S. Cl. 194—1 G **13 Claims**

10. In a coin chute device where there is, in combination, a housing having a guide track passage; and a coin slide disposed for reciprocal movement between projected and retracted positions in said guide track; wherein the improvement comprises:

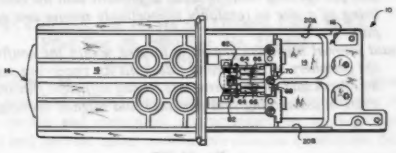
said coin slide having a first coin socket;

said slide further having at lease one removable plug forming a ring about said first coin socket to define the perimeter of said socket when said plug is in place;

said coin slide having a second coin socket formed by the removal of said plug;

said first and second sockets being sized to carry first and second predetermined sized coins;

said second coin socket being larger in perimeter than said first



coin socket, the perimeter of said first socket lying within the perimeter of said second socket; and

blocking means mounted on the chute and positioned to engage said slide to block movement of said slide in the absence of a predetermined sized coin in either of said first or second sockets.

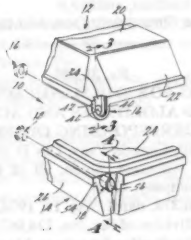
Re. 31,086
PLASTIC HINGE CONSTRUCTION

Edward M. Johnson, Jr., Matteson, Ill., and John T. Stone, Saylorsburg, Pa., assignors to W. R. Grace & Co., Cryovac Division, Duncan, S.C.

Original No. 4,029,234, dated Jun. 14, 1977, Ser. No. 721,935, Sep. 10, 1976. Application for reissue Jun. 14, 1979, Ser. No. 48,429

Int. Cl.³ B65D *51/04*

U.S. Cl. 220—337 **8 Claims**



8. A plastic blow molded container blow molded from an extruded, hollow parison of thermoplastic material and including a lid and a base and being connected together for relative pivotal movement by a hinge structure, with each of the lid and base having side walls, said hinge structure comprising:

a pin structure molded integrally with one of the lid and base, and a journal structure molded integrally with the other of the lid and the base, said pin structure being rotatably supported by said journal structure,

said pin structure comprising a generally solid pair of pin members each having a generally circular cross-section and being formed by compression molding of the material generally from a double wall of the parison to form said circular cross-section, said pin members being axially aligned and extending axially outwardly from opposite first side walls, each of said first side walls having a first indented portion with the associated ones of said pins extending outwardly from said first indented portion whereby said one pin terminates proximately within the confines of said first indented portion,

said journal structure comprising a pair of journal members defining a pair of coaxially aligned openings *each of said journal members depending from opposite second side walls, each of said second side walls having a second indented portion terminating in a generally non-indented strap portion and having a support portion located axially inwardly from said strap portion and from said second indented portion, said strap portion defining a first generally semicircular opening and said support portion defining a second generally semicircular opening axially offset from and facing in a direction towards said first generally semicircular opening whereby a pin opening is defined by each of said journal members, each of said pin opening being in axial alignment with the other and being of a size to rotatably supportingly receive one of said pins,*

said journal members generally located within the confines of the periphery of said second side walls for receiving said pin members *said journal structure having sufficient flexibility to assist in assembling said pins into said aligned openings.*

Re. 31,087

METHOD FOR SEPARATING OIL FROM WATER

William E. Sohl, Fayetteville, Ark., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,764,527, dated Oct. 9, 1973, Ser. No. 250,373, May 4, 1972. Continuation of Ser. No. 833,172, Jun. 13, 1969, abandoned. Application for reissue Apr. 16, 1981, Ser. No. 254,757

Int. Cl.³ E02B *15/04*

U.S. Cl. 210—671 **27 Claims**

1. A method for isolating water-immiscible oils from a mixture of said oils in an aqueous medium, said method comprising:

a. contacting the mixture with a fibrous web which comprises a plurality of entangled oleophilic fibers, said fibers being hydrophobic in the presence of oil and having a diameter size in the range between about 0.1 micron to about 100 microns; said fibrous web having a bulk density, expressed as a percentage of fiber density, in the range between about 2 percent and about 35 percent;

b. allowing the oil to wet the fibrous web to the exclusion of the aqueous medium; and

c. removing the fibrous web from said mixture.

Re. 31,088

PROCESS FOR THE MANUFACTURE OF UNSATURATED ALDEHYDES AND ACIDS FROM THE CORRESPONDING OLEFINS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Macedonia, and Ernest C. Milberger, Solon, all of Ohio, assignors to Standard Oil Company, Ohio

Original No. 3,956,378, dated May 11, 1976, Ser. No. 390,094, Aug. 20, 1973. Division of Ser. No. 224,967, Feb. 9, 1972, Pat. No. 3,892,794. Application for reissue May 11, 1978, Ser. No. 904,941

Int. Cl.³ C07C *51/16*

U.S. Cl. 562—535 **14 Claims**

4. A process for the production of methacrylic acid by the oxidation of methacrolein with molecular oxygen in the vapor phase at a reaction temperature of about 200° C. to about 500° C. in the presence of a promoted, reduced, antimony oxide-molybdenum oxide containing catalyst wherein the catalyst is prepared by combining the following components in any order:

a. an aqueous slurry of molybdenum trioxide;

b. a reducing agent selected from the group consisting of a finely divided metal, sulfur, sulfur dioxide, hydrogen sulfide, hydrazine hydrate, ammonia, hydroxylamine, and an organic reducing agent capable of reducing at least some of the molybdenum to a valence state below +6 in a ratio of from about 0.0001 to 0.2 mole of the reducing per mole of molybdenum;

c. antimony oxide in a ratio of from about 0.01 to 9 moles of antimony oxide per mole of molybdenum; and

d. at least one promoter element in the form of a non-oxidizing compound selected from the group consisting of tellurium, tungsten, titanium, manganese, nickel, iron, cobalt, lead, rhenium, bismuth, tin, uranium, chromium, phosphorus and boron, said promoter element being added in a ratio of from about 0.0001 to 1.0 moles of promoter element per mole of molybdenum.

Re. 31,089

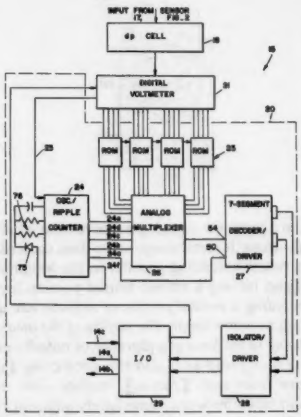
TRANSDUCER SYSTEM FOR CONTINUOUS MONITORING LIQUID LEVELS IN STORAGE TANKS AND THE LIKE

John S. Adamson, La Habra, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Original No. 4,194,177, dated Mar. 18, 1980, Ser. No. 854,917, Nov. 25, 1977. Application for reissue Dec. 29, 1980, Ser. No. 220,626

Int. Cl.³ H04Q *9/14*; G08C *19/16*

U.S. Cl. 340—825.55 **21 Claims**



14. Transducer system for generating a digital code indicative of liquid level within a storage tank or the like, upon receipt of a square wave interrogation signal from a transmitter/receiver of a tank gauging system located at a central station remote from said storage tank but electrically connected to said transducer system through an INTERROGATION, a MARK and a SPACE line of said tank gauging system comprising:

(A) means for providing a series of input signals representative of liquid level within said tank, said means being in circuit with a series of look-up read-only-memories (ROM's);

(B) I/O network for receiving said interrogation signal and connected to (A) for generating a reset signal therefrom in response to said interrogation signal;

(C) an oscillator/ripple counter formed essentially of MSI's connected to (A) and including at an input a network for receiving said reset pulse from (A), said oscillator/ripple counter generating, in response to said reset pulse, sets of square wave pulses of differing repetition rates and pulse widths;

(D) a multiplexer and multi-segment decoder/driver means connected to each other and to (B) responding to selected sets of said square wave pulses to generate a synthetic digital code indicative of liquid level at microcircuit signal levels at an output means of said decoder/driver means;

(E) isolator/driver means having one or more inputs connected to said decoder/driver means of (D), and one or more output means connected to said MARK and SPACE lines controllable as a function of said synthetic digital code to drive said MARK and SPACE lines between tank gauging operating potentials for generating said digital code of interest at said central station whereby said liquid level condition within said storage tank can be indicated.

PLANT PATENTS

GRANTED NOVEMBER 23, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,953
PISTACHIO TREE

Henry P. Anderson, and Kenneth L. Puryear, both of Pioneer Nursery, 800 N. Chester, Bakersfield, Calif. 93308

Filed Jul. 27, 1981, Ser. No. 286,872
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—30 1 Claim

1. A new and distinct variety of pistachio tree, identified as PN-17-F, characterized by a mature tree of rounded upright shape, having several main branches and usually a central leader; rapid growth, abundant, leathery foliage, ease of propagation by budding or grafting; and further characterized by the abundant production of female flowers, in clusters, followed by seeds which are especially desirable for planting when pollenized by the male variety, identified as PN-46-M, said hybrid seeds producing a fast growing, disease resistant tree of value for use as understock upon which to bud or graft commercial nut bearing varieties of pistachio such as 'Kerman'.

4,954
DISTINCT VARIETY OF BLACK WALNUT TREE

Walter F. Beineke, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Apr. 16, 1981, Ser. No. 254,625
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—32 1 Claim

1. A new and distinct variety of black walnut tree substantially as illustrated and described, which has excellent timber quality, is fast growing, has fairly strong central stem tendency, little sweep, few crooks; earlier than average in time of leafing, and low nut production.

4,955
DISTINCT VARIETY OF BLACK WALNUT TREE

Walter F. Beineke, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Apr. 16, 1981, Ser. No. 254,626
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—32 1 Claim

1. A new and distinct variety of black walnut tree substantially as illustrated and described which has excellent timber quality, average in growth rate, has strong central stem tendency, little sweep, few crooks; earlier than average in time of leafing, pistillate flowers very late, pollen sheds very early, produces abundant annual crops of small nuts; averages 3 to 4 per cluster, the percentage of weight of kernel to nut averages approximately 18.8 percent; nut bearing begins early in life of tree.

4,956
APPLE TREE

Lucian D. Claypool, 631 W. 5th St., Ontario, Calif. 91762

Filed Dec. 15, 1980, Ser. No. 216,421
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized by its vigorous growth and harvest under undesirable climatic conditions, the tart flavor and early ripening of its fruit, the unusually small core of its fruit, and the resistance of the flesh of its fruit to discoloration and deterioration upon being sliced.

4,957
AVOCADO TREE

John K. Bowker, 16290 Palomino Dr., Porterville, Calif. 93257, assignor to John King Bowker; Victor Vane Bowker, Jr. and Susan Elizabeth Buckley, all of Porterville, Calif.

Filed Feb. 10, 1981, Ser. No. 233,255
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—44 1 Claim

1. A new and distinct variety of avocado tree as described and illustrated, characterized particularly by its prolonged harvest period, the thick skin of the fruit, and limited height and limited spread of tree.

4,958
CHRYSANTHEMUM NAMED BRONZE PARLIAMENT

Peter S. Hesse, West Chicago, Ill., assignor to Pan American Plant Company, Parrish, Fla.

Filed May 7, 1981, Ser. No. 261,616
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct chrysanthemum cultivar, substantially as herein shown and described, distinguished by its unique bronze coloration and its similarity to "Parliament" U.S. Plant Pat. No. 4,326) in substantially all aspects except color.

PLANT PATENTS

PATENTS

GRANTED NOV. 23, 1982

ERRATA

For CLASS	See PATENT NO.
464–033	4,359,880
604–256	4,360,024
604–180	4,360,025
524–494	4,360,120
464–175	4,360,209
409–017	4,360,296
416–141	4,360,337
523–456	4,360,456
548–490	4,360,464
548–568	4,360,465
549–442	4,360,466
549–397	4,360,467
549–462	4,360,468
260–207	4,360,669
378–042	4,360,731
378–093	4,360,734
378–134	4,360,735

PATENTS

GRANTED NOVEMBER 23, 1982

GENERAL AND MECHANICAL

4,359,783

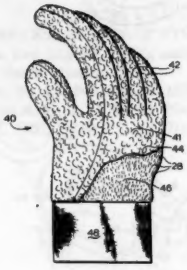
WEARING APPAREL AND METHODS FOR THE MANUFACTURING OF WEARING APPAREL

Richard C. Andrews, Coshocton, Ohio, assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Feb. 12, 1981, Ser. No. 233,743

Int. Cl.³ A41D *19/00*; A41B *13/10*; A43B *13/22*; B32B *5/06*

U.S. Cl. 2—161 R **28 Claims**



15. A work glove characterized by

(a) at least a portion of said glove comprised of a laminate, said laminate comprising

(1) a non-woven fibrous web of staple fiber;

(2) a woven or knitted web;

(3) the staple fiber from said non-woven fibrous web joining said non-woven web and said woven or knitted webs together;

(4) said staple fiber extending from the exposed surface of said woven or knitted web to form a base for a subsequently applied and textured coating; and

(5) an elastomeric coating on said exposed surface of said woven or knitted web;

(b) said laminate being joined by said staple fiber by needling with a density of penetration within the range of between about 400 and 700 penetrations per square inch;

(c) the depth of penetration of said staple fiber being within the range of between about 0.25 and 0.50 inches; and

(d) the denier of said fiber being within the range of between about 1.5 and 15.

4,359,784

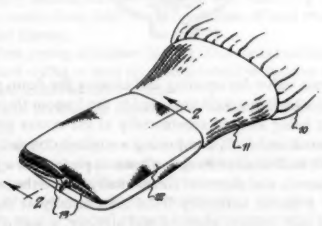
SLEEVE-MITTEN COMBINATION FOR GARMENT

Shirley L. Harrington, 51 E. Utica, Buffalo, N.Y. 14209

Filed Nov. 17, 1980, Ser. No. 207,685

Int. Cl.³ A41D *27/10, 19/00*

U.S. Cl. 2—269 **2 Claims**



1. A combined sleeve and mitten-formation for jackets or outerwear comprising a sleeve formation terminating in a tubular mitten-formation which extends outwardly from the end of the sleeve formation, the tubular mitten-formation defining a tubular member having a unitary opening spaced from the sleeve formation and disposed transversely of the longitudinal axis thereof, and a slide fastener extending across the unitary opening of the tubular mitten-formation which when closed fully encloses the wearer's hand and when opened permits the mitten formation to be turned back upon the sleeve formation to form a cuff and more or less fully expose the wearer's hand.

4,359,785

HIP JOINT PROSTHESIS

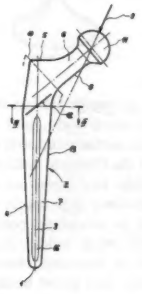
Peter G. Niederer, Zollikofen, Switzerland, assignor to Gebruder Sulzer, Aktiengesellschaft Protek A.G., Winterthur, Switzerland

Filed Sep. 29, 1980, Ser. No. 191,414

Claims priority, application Switzerland, Oct. 11, 1979, 9216/79

Int. Cl.³ A61F *1/24*

U.S. Cl. 3—1.913 **3 Claims**



1. A hip joint prosthesis comprising

a shank for anchoring in a cement bed in a surgically prepared femur, said shank having a longitudinal median axis, a narrow blade-like portion extending from a distal end with a conical taper symmetrically of said axis to define a narrow lateral side and a narrow medial side, and a beveled side extending from said lateral side at an angle inwardly toward said axis and an arcuate side extending from said medial side on a radius of a circle;

a neck angularly disposed relative to said axis of said shank and having a lower edge connected to said arcuate side of said shank; and

a collar-like projection between said shank and said neck, said projection extending at least approximately in the direction of said neck relative to said shank.

4,359,786

ACCESSORY FOR USE IN SUPPORTING A URINAL MEMBER AT A PATIENT'S BEDSIDE IN HOSPITALS AND THE LIKE

Carl H. Rosberg, and Hazel R. Rosberg, both of 127 Airport Rd., Hyannis, Mass. 02601

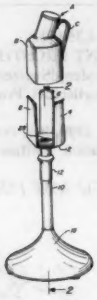
Filed Sep. 8, 1980, Ser. No. 184,774

Int. Cl.³ A47K *1/08*; A45D *19/04*

U.S. Cl. 4—144.1 **3 Claims**

1. A urinal stand construction for use in supporting a urinal member of the class commonly employed in hospitals, charac-

terized by a substantially cylindrical container body having a flattened front wall portion and an opposite rear wall side portion formed with a handle, an upper end of the container body presenting a tubular fluid guide part which extends angularly and rearwardly away from the flattened wall portion, said urinal stand construction including a urinal holder and means for supporting the urinal holder in a raised position at a bedside, said urinal holder comprising a flat retaining part on which the bottom of the said urinal member may be received, vertically disposed resilient clip portions located around outer edges of the flat retaining part in spaced apart relationship, two of said clip portions being arranged to engage the urinal container body at opposite sides of the urinal handle, a third clip



portion arranged to engage against the said flattened side wall of the urinal container body, said third clip portion being formed with a flat surface and said surface being of a shape which mates with the flattened wall portion to guide the urinal into the urinal holder into a position in which the tubular fluid guide part is maintained in properly oriented relationship and releasably secured in an upright position, wherein said means for supporting the urinal holder includes a tubular body, a pedestal base and a fastening element detachably securing these parts together, said urinal holder characterized by a flat retaining part in which is formed a conical seat for receiving a nut element located in threaded relationship with a fastening element.

4,359,787

LAVATORY SEAT COVER FOR CLOSET

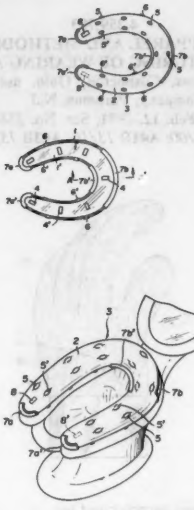
Satoshi Shoji, 3-9, 1-chome, Tsurukawa, Machida-shi, Tokyo, Japan

Filed Oct. 6, 1980, Ser. No. 194,705
Int. Cl.³ A47K *13/14*
U.S. Cl. 4—245 **8 Claims**

1. A lavatory seat cover for a water closet bowl comprising a back board which corresponds in shape and fits onto a lavatory seat;

a laminate comprising a plurality of thin sheets of material which correspond to the shape of said back board and are secured onto said back board, each one of said cover sheets defining a plurality of recesses over its surface area which recesses cooperate with the recesses defined in the underlying sheet to restrict lateral movement between the sheets;

adhesive means located on the back surface of said back board;



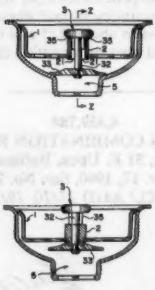
and a plurality of edge nipping members provided at the peripheral edges of said back board and said laminate for securing said laminate onto said back board.

4,359,788

DISC TYPE KITCHEN SINK DRAIN VALVE

Shu-Lien Liou, 2 Fl., No. 33, Lane 52, Szu Wei Rd., Taipei, Taiwan

Filed Aug. 13, 1980, Ser. No. 177,834
Int. Cl.³ A47K *1/14*; E03C *1/26*
U.S. Cl. 4—287 **4 Claims**



1. A drain valve for opening and closing the drain port of a kitchen sink having a well provided in the bottom thereof, said drain port being located substantially at the center portion of the bottom of said well, comprising a strainer coaxially placed in the well, said strainer having a bottom plate with a plurality of holes therein and disposed substantially above the bottom of said well, a sleeve vertically fixed substantially at the center portion of said bottom plate of said strainer, a valve member having a valve stem slidably inserted in said sleeve and a valve body fixed to the lower end of said valve stem, said valve body being made of an elastic material in circular disc shape having an outside diameter larger than the inside diameter of said

drain port so that the bottom surface of said valve body is capable of abutting the surface of said well around said drain port when said valve member is lowered for closing said drain port, said valve body being adapted to cover and uncover said drain port when the valve stem is lowered and raised, respectively, said valve stem being provided with key means slidably received in a longitudinal slot formed on the inner wall of said sleeve when said valve member is lowered to cover said drain port with said valve body, said sleeve being provided with a support means for supporting said key means when said valve stem is raised to an uppermost position to open said drain port and then rotated.

4,359,789

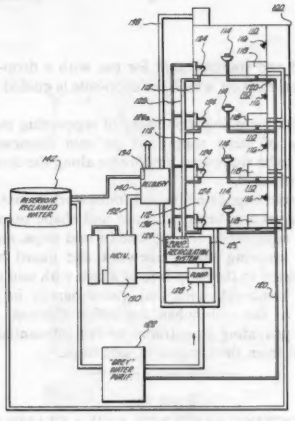
SEWERLESS DISPOSAL SYSTEM

George C. Roberts, Los Angeles, Calif., assignor to Monogram Industries, Inc., Santa Monica, Calif.

Continuation of Ser. No. 221,866, Jan. 31, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,847

Int. Cl.³ E03C *1/01;* **E03D** *9/02, 5/016;* **E03B** *11/00*

U.S. Cl. 4—300 **17 Claims**



1. An improved sewerless disposal system for waste liquid and solid material from a dwelling having toilet and household waste producing units other than toilets, such as baths, sinks and washing machines, said system comprising:

(a) recirculating toilet means including a bowl having a toilet waste receiving opening and an outlet, means for supplying liquid to said bowl, means connected to said outlet of said toilet bowl for receiving said liquid from said liquid supplying means and toilet waste from said bowl, and means for separating liquid and means for causing recirculation of liquid from said receiving means through said supply means, said bowl and to said receiving means,

(b) an outlet from said receiving means of said recirculating toilet means,

(c) a first piping structure having inlet means connected only to said outlet of said receiving means to receive only toilet waste material therefrom,

(d) waste producing means other than toilets in said dwelling,

(e) a second piping structure having inlet means connected only to said waste-producing means other than toilets to receive waste water therefrom,

(f) waste water purifier means having an inlet connected only to said second piping structure for receiving material from said second piping structure for generating water of tertiary quality, and for generating separate waste, said waste water purifier means having an outlet for said water and an outlet for said separate waste, and

(g) receiving and holding means, means connecting said first piping structure to said receiving and holding means for conducting said toilet waste from said first piping structure to said receiving and holding means, and means connecting said outlet for said separate waste of said waste water purifier means for conducting said separate waste from said waste water purifier means to said receiving and holding means.

4,359,790

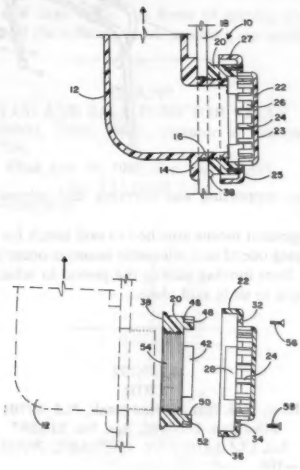
SUCTION OUTLET ASSEMBLY FOR WHIRLPOOL BATHS AND THE LIKE

Philip E. Chalberg, 1119 Maple Ave., Orange, Calif. 92668

Filed Dec. 12, 1980, Ser. No. 215,887

Int. Cl.³ E03C *1/02;* **A61H** *33/02*

U.S. Cl. 4—541 **8 Claims**



1. A suction outlet assembly for use in whirlpool baths for providing a passageway for water pumped out of the bathtub through an orifice therein by a recirculation pump, the assembly comprising:

an elbow structure having an elbow pipe portion for directing said water to said pump after said water exits said bathtub, said elbow structure also having an integral flange for bearing against the exterior surface of said bathtub around said orifice, and an extended threaded portion for protruding through said orifice and into the interior of said bathtub, and

means for securing said elbow structure relative to said bathtub, said means being threaded to engage said extended threaded portion of said elbow structure at the interior surface of said bathtub.

4,359,791

FOLDING TRANSFER BENCH WITH IMPROVED ROLLER AND ARM ASSEMBLY

Morton I. Thomas, Nyack, N.Y., assignor to Temco Products, Inc., Passaic, N.J.

Continuation-in-part of Ser. No. 72,009, Sep. 4, 1979, Pat. No. 4,253,203. This application Dec. 15, 1980, Ser. No. 216,171

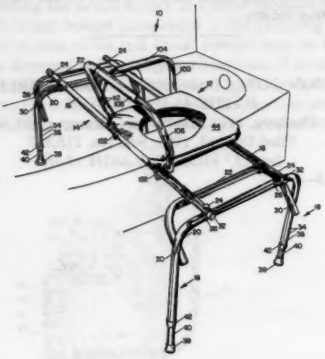
Int. Cl.³ A61H *33/02*

U.S. Cl. 4—546 **10 Claims**

1. In a transfer bench apparatus including a movable chair, rolled means attached to the underside of said chair, a bench including at least two substantially parallel tubular tracks for

supporting said roller means, and releasable means attached to said chair for loosely engaging at least one of said tubular tracks, the improvement comprising:

bracket means attached to the underside of said chair for rotatably supporting said roller means, said bracket means



further supporting and carrying said releasable means; and,

an engagement means attached to said bench for selectively engaging one of said releasable means in order to keep said chair from moving during the period in which a patient attempts to sit in said chair.

4,359,792

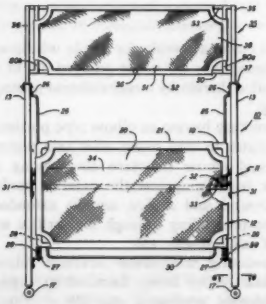
CRIB

Clara M. Dale, P.O. Box U, Red Bank, N.J. 07701

Filed Jan. 17, 1980, Ser. No. 113,097

Int. Cl.³ A47D *7/01, 7/02;* A47C *29/00*

U.S. Cl. 5—100 **23 Claims**



11. A crib comprising

a pair of end wall sections, each said end wall section having a pair of legs for supporting said end wall sections in an upstanding manner;

a pair of side wall sections mounted between said end wall sections in an upstanding manner to define an enclosure therewith; and

a canopy mounted on and between said end wall sections in vertically spaced relation to said side wall sections, and over said enclosure, said canopy having at least one pivotally mounted section movable from a closed position over said enclosure to an open position to provide access to said enclosure.

4,359,793

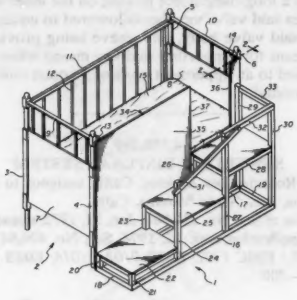
INFANT CRIB AND STAIRCASE

Tsugimori Hosono, 1105 Kipp, Kemah, Tex. 77065

Filed Apr. 28, 1980, Ser. No. 144,417

Int. Cl.³ A47D *7/02, 15/00*

U.S. Cl. 5—100 **8 Claims**



1. A guard and staircase unit for use with a drop-side crib having vertical rods on which the drop-side is guided comprising

a framework including a plurality of supporting members,

a plurality of steps supported on said framework and adapted to be supported lengthwise along the drop-side of a drop-side crib,

a guard barrier supported on said framework in juxtaposition to said steps and being of a size and shape providing an opening adjacent to the top one of said steps, and

means for securing said framework and guard barrier in juxtaposition to the drop-side of a crib with said drop-side open or removed, with said guard barrier in guarding relation to the crib when assembled thereon, and said opening providing an entrance or exit substantially at the bed level from the top one of said steps.

4,359,794

SELF-LOCKING FASTENER AND A STAMP FOR MAKING SAID FASTENER

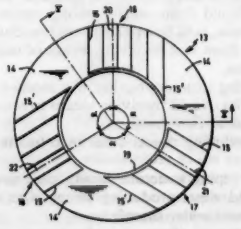
Johannes E. Bouwman, Helmond, Netherlands, assignor to Nedschroef Octrooi Maatschappij N.V., Helmond, Netherlands

Division of Ser. No. 2,229, Jan. 9, 1979, Pat. No. 4,294,300. This application Jan. 13, 1981, Ser. No. 224,807

Claims priority, application Netherlands, Jan. 13, 1978, 7800432

Int. Cl.³ B21D *53/24*

U.S. Cl. 10—85 **4 Claims**



1. A male die for making a self-locking threaded fastener where the die has a planar working surface with a plurality of elongated teeth thereon, characterized in that the teeth are located in a plurality of groups in that the die is in the form of

an annulus having a bore, in that the teeth in each group extend parallel with each other, in that a tooth on an edge of each group extends tangentially to the bore, in that the teeth have a height which is the same over the entire length of the teeth, in that the teeth extend above said working surface, and in that the teeth have roots which are disposed below said working surface.

4,359,795

BRIDGE PIERS

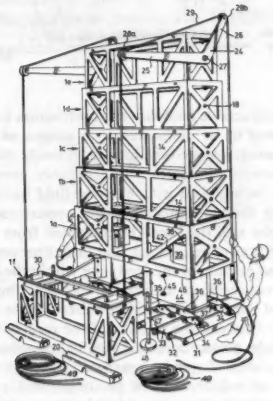
James P. FitzGerald-Smith, Ossemsley, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 19, 1980, Ser. No. 208,446

Claims priority, application United Kingdom, Nov. 27, 1979, 7940912

Int. Cl.³ E01D *19/02*

U.S. Cl. 14—75 7 Claims



1. A bridge pier assembly including a multiplicity of serially gradated cribs, each nestable within the next larger in a stowed configuration and each mountable upon the next larger in an erected configuration, a pair of davits attachable to two opposing end faces respectively of any one of the cribs so as to be rotatable in a substantially vertical plane when the crib is disposed in the erected configuration, and a pair of base units each comprising a grillage and a telescopic leg pivotally supportable upon the grillage, the telescopic legs in said base units being adapted for jointly supporting the largest crib.

4,359,796

CAR WASHING MECHANISM

Edward Holbus, 21 Stonewood Ct.; Jeffrey A. Holbus, 1923 Geneva St., both of Racine, Wis. 53402, and William N. Holbus, 4326 Kennedy Dr., Apt. 202, Racine, Wis. 53404

Filed Aug. 3, 1981, Ser. No. 289,800

Int. Cl.³ B60S *3/06*

U.S. Cl. 15—53 AB 12 Claims

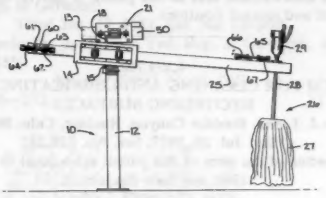
1. A car wash mechanism, including:

an upright support;

a tiltable cage pivotably mounted on said support;

a boom slidably received within said cage and mounting a rotating brush adjacent its outer end; and

means for tilting said cage between a first position in which the boom slides outwardly of said cage under the force of gravity and a second position in which the boom retracts



within said cage under the force of gravity and by the reaction of the rotating brush against a car surface.

4,359,797

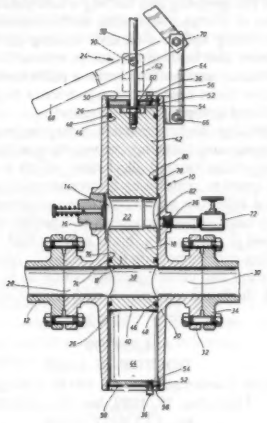
PLUG AND BALL INJECTOR VALVE

James W. Banks, Tulsa, Okla., assignor to Geosource Inc., Houston, Tex.

Filed Apr. 24, 1981, Ser. No. 257,371

Int. Cl.³ B08B *9/04*

U.S. Cl. 15—104.06 A 18 Claims



1. A plug and ball injector valve comprising:

a valve cylinder for insertion into a pressurized fluid line, which cylinder extends substantially normal to the pressurized fluid line and which cylinder defines axially aligned inlet and outlet channels for the pressurized fluid and a loading port for the introduction of a plug or ball into the cylinder;

a piston movable between a first and a second position within the valve cylinder, said piston having forward and rearward portions which do not pass before the loading port during movement of the piston between its first and second positions and said piston having its forward and rearward portions sealed against the cylinder when the piston is in the first or second position;

an injection passageway extending through the piston, the injection passageway being aligned with the loading port of the cylinder when the piston is in its first position and aligned with the inlet and outlet channels of the cylinder for the pressurized fluid when the piston is in its second position;

an intermediate seal disposed about the piston between the

loading port and the injection passageway when the piston is in its second position; and

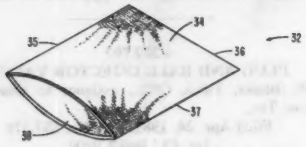
a pressure balancing cavity area between the valve cylinder and the piston which is brought into communication with the intermediate seal as the piston is moved between its first and second positions.

4,359,798

SYSTEM FOR CLEANING AND LUBRICATING SOUND RECORDING SURFACES

Thomas J. Loran, Boulder Canyon, Boulder, Colo. 80302

Filed Jul. 29, 1977, Ser. No. 820,232
The portion of the term of this patent subsequent to Aug. 23, 1998, has been disclaimed.
Int. Cl.³ B08B *1/00*
U.S. Cl. 15—104.94 **7 Claims**



1. A mitt for applying and buffing a lubricating and cleaning composition to a sound recording surface comprising:

said mitt being soft and flexible having mutually opposed applicator and buffing surface portions;

said applicator and buffing surface portions being interconnected to form a pocket therebetween to facilitate insertion of and grasping with the hand;

said applicator surface portion being impregnated with a lubricating and cleaning composition which comprises a mixture of fluorinated alkyl ester which is normally solid under ambient conditions in combination with a material selected from the group consisting of tetrafluoroethylene telomers and anti-static agents compatible with said fluorinated alkyl ester and a liquid carrier; and

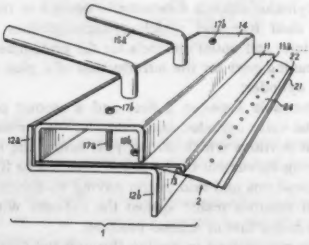
said buffing surface portion functioning to remove the excess lubricating and cleaning composition so as to form a controlled thickness coating on said recording surface.

4,359,799

DOCTOR BLADES

Ake A. Bööse, Larsbergsvägen 46, 18138 Lidingö, Sweden

Filed Jun. 18, 1980, Ser. No. 160,768
Int. Cl.³ B41F *35/04*
U.S. Cl. 15—256.51 **12 Claims**



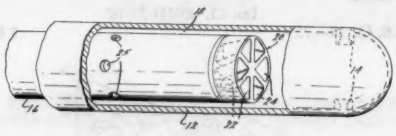
1. A doctor blade assembly comprising a resiliently flexible carrier plate, said carrier plate having a rearward mounting portion by which it is adapted to be clampingly mounted and a free forward portion, arched presser plate means extending along the carrier plate with its concave side directed towards the carrier plate, said presser plate means overlying only said forward portion of said ccarrier plate, a resiliently flexible doctor blade strip of constant thickness clamped between the outer edges of the carrier plate and the presser plate means and a row of ties passing through apertures in the carrier plate and the presser plate means to hold the presser plate means in a stressed condition to clamp the doctor blade strip, the apertures in the carrier plate and presser plate means being elongated to permit lengthwise movement of the ties relative to the carrier plate and/or the presser plate means.

4,359,800

SOOTBLOWER FEED AND LANCE TUBE STRUCTURE WITH IMPROVED TURBULIZER SYSTEM

Burton D. Ziels, Lancaster, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 5, 1981, Ser. No. 240,799
Int. Cl.³ F23J *3/02*
U.S. Cl. 15—316 R **4 Claims**



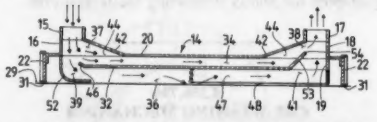
1. In a retractable sootblower construction including a feed tube adapted to be connected to a source of blowing fluid under pressure, a lance tube having an inside diameter exceeding the outside diameter of and slidably overfitted on and adapted to be supplied with blowing fluid from the feed tube and having discharge nozzle means appurtenant to its outer end whereby said fluid may be projected from the lance tube against surfaces to be cleaned, and turbulizer means carried by an open end portion of the feed tube within the lance tube, the internal cross-sectional area of the turbulizer means being less than that of the feed tube, said turbulizer means causing a drop in pressure between the interior of the feed tube element and the lance tube during operation, the improvement which comprises a plurality of openings extending through the wall of the feed tube at radially spaced positions, said openings being spaced longitudinally from said turbulizer and from said open end portion of the feed tube.

4,359,801

PICK-UP HEAD FOR SURFACE CLEANING APPARATUS

Jimmy W. Tate, P.O. Box 325, Anniston, Ala. 36202

Filed May 4, 1981, Ser. No. 260,333
Int. Cl.³ E01H *1/08*
U.S. Cl. 15—346 **8 Claims**



1. In an elongated, downwardly opening pick-up head for an air flow surface cleaning apparatus adapted for movement over a surface to be cleaned and extending transversely of the direction of movement thereof, with said pick-up head having a top wall connected to depending side walls and with one end portion of said pick-up head communicating with the pressure side of an air circulating means and the other end portion thereof communicating with the suction side of said air circulating means,

(a) an elongated horizontal baffle extending between said depending side walls of said pick-up head in spaced rela-

tion to said top wall and defining an upper passageway having an inlet in communication with said pressure side of said air circulating means and an outlet in communication with said suction side thereof and defining a lower passageway between said baffle and the surface to be cleaned having an inlet communicating with said pressure side of said air circulating means and an outlet communicating with said suction side thereof and with the outlets of said upper and lower passageways discharging into a common conduit communicating with said suction side, and

(b) the cross sectional area of said outlet for said upper passageway being restricted so that the velocity of air passing therefrom is increased to create a venturi effect which aids in drawing air from said lower passageway into said common conduit.

4,359,802

ADJUSTABLE HINGE

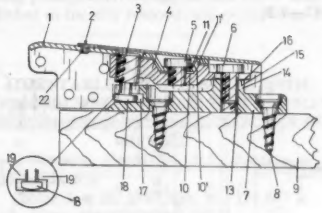
Erich Röck, Küferstrasse, Fed. Rep. of Germany, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed May 29, 1980, Ser. No. 154,136

Claims priority, application Austria, Jun. 5, 1979, 4029/79

Int. Cl.³ E05D *7/04*

U.S. Cl. 16—238 **10 Claims**



1. An adjustable hinge for use in mounting a door to an article of furniture, said hinge comprising:

a mounting plate adapted to be fixed to a side wall of an article of furniture, said mounting plate having in a forward end thereof a longitudinally extending recess open at said forward end of said mounting plate;

an intermediate member having at a rear end thereof a longitudinally extending slot open at said rear end and at a forward end thereof an internally threaded opening;

an adjusting screw threaded into said internally threaded opening, said adjusting screw having a head slidably extending into said recess in said forward end of said mounting plate;

an intermediate member clamping screw extending through said slot in said rear end of said intermediate member and threaded into said mounting plate;

a hinge arm having a U-shaped transverse cross-sectional configuration and being positioned over said intermediate member, said hinge arm having therein a transversely extending guiding hole;

a hinge arm clamping screw extending through said guiding hole and being threaded into said intermediate member;

said hinge arm being adjustable transversely with respect to said intermediate member through the length of said guiding hole;

said intermediate member and said hinge arm being adjustable longitudinally with respect to said mounting plate along said slot in said rear end of said intermediate member; and

said intermediate member and said hinge arm being adjustable toward and away from said mounting plate by rotation of said adjusting screw.

4,359,803

HINGE FOR CABINET DOOR MIRROR

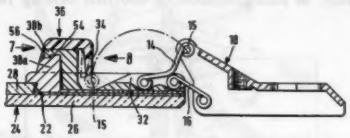
Karl Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger KG, Möbelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Jan. 13, 1981, Ser. No. 224,690

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001559

Int. Cl.³ E05D *11/10, 7/12*

U.S. Cl. 16—272 **12 Claims**



1. Over-center hinge for relatively thin doors of cabinets, especially of bathroom mirrored cabinets, comprising: a relatively thin door-related part adapted to be fastened, in a mating recess provided on the inside of the door facing the cabinet and open at the door edge, said door-related hinge part being divided into an outer mounting plate adapted to be fastened in said recess and which mounting plate is likewise open at the end adjacent the open door edge, and a separate link holder adapted to be inserted into said mounting plate from the open edge, said link holder being articulately joined to a supporting arm fastenable to a supporting wall of the cabinet, said hinge having a projection extending from the inside of the door, a molded cap removably fastened to said projection, said cap carrying a tongue extending into the path of a contact surface provided on the supporting arm and resiliently compressible by said contact surface, and on which tongue the contact surface slides during a part of the closing movement of the hinge through a dead center position, on one side of which dead center position the tongue exercises on the supporting arm through the contact surface a force acting in the hinge-open direction, and on the other side of which said tongue exercises a force in the hinge-closed direction, said link holder having lateral projections engaging in grooves of the mounting plate which extend in inserting direction and open in the open end of the mounting plate, and fastening means for securing, in a form-locking manner, the link holder in proper installed position against withdrawal from the mounting plate against the insertion direction.

4,359,804

LOAD SUPPORTING HINGE STRUCTURE WITH CONCEALED ANGULAR BEARING

Delmar McNinch, Rock Falls, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

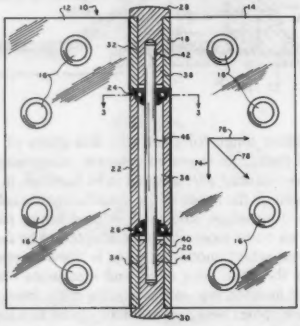
Filed Dec. 18, 1978, Ser. No. 970,556

Int. Cl.³ E05D *11/14*

U.S. Cl. 16—276 **7 Claims**

4. In a ball bearing hinge structure for mounting a door to a door jamb, or the like, wherein the bearing means is not visable in the assembled condition, comprising: a pair of hinge leaves, one of said pair of leaves including at least a pair of spaced end knuckles, the other of said pair of leaves including at least one intermediate knuckle, said knuckles each including a central axis bore, and pintle means disposed in said bores to maintain said leaves in assembled relation; said at least one intermediate knuckle, adjacent the end thereof opposite the upper end knuckle, including a counter bore, having a radially inner curved surface and a bearing means disposed within said counter bore for accommodating both horizontal and vertical loads at the same time such that in the assembled condition of said hinge, said bearing means is received within said bore and concealed from view, said bearing means comprising, a first radially outer race member engaged in said counter bore and,

having a radially outer curved surface corresponding in shape to the radially inner curved surface of said counter bore, and said first race member further including a radially inner surface portion of an arcuate configuration defining a first bearing raceway and terminating at its radially inner periphery in a substantially flat portion free of any shoulder means and which defines a central aperture for said first race member of larger diameter than said pintle, and a second radially inner race member having an axially extending portion and a radially extending portion which provide a radially outer surface portion of an arcuate configuration to define a second bearing raceway, in facing relation to said first bearing raceway, a



plurality of ball bearing elements disposed between said first and second arcuate raceways, said axially extending portion of said second race member defining the central aperture for said second race member, which axially extending portion closely receives said pintle to lend non-bending support thereto, and said portion extends through the central aperture of said first race member, and said radially extending portion being substantially flat and free of shoulder means and providing a radially extending annular surface against which the end knuckle is engaged in supporting relation, and means on said axially extending portion of said second race member for maintaining said bearing means in assembly.

4,359,805

WINDOW SASH HINGE

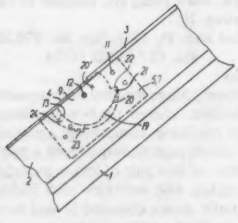
Erik S. Berneke, Copenhagen, Denmark, assignor to V. Kann Rasmussen Holding A/S, Soborg, Denmark

Filed Jun. 29, 1981, Ser. No. 278,427

Claims priority, application Denmark, Jul. 8, 1980, 2943/80

Int. Cl.³ E05D *7/086*

U.S. Cl. 16—364 **5 Claims**



1. A hinge device for tiltable windows including a frame and a sash and having external cover rails positioned on the frame and sash members of the window, respectively, and overlapping each other at the hinge area in the closed position of the window, said hinge device comprising frame and sash parts intended for being firmly secured to the frame member and the sash member, respectively, and an intermediate part connecting said frame and sash parts, the sash part during the movement of the sash from its closed position being successively pivotable in relation to the frame part about a first axis defining a rotation of the intermediate part in relation to the frame part and a second axis defining a rotation of the sash part in relation to the intermediate part, said first and second axes being constituted by two pivot pins connecting the intermediate part with the frame part and the sash part at points above and below, respectively, an edge recess provided in the intermediate part and giving room for the overlapping end of the sash cover rail when the sash part is rotated in the opening direction in relation to the intermediate part, said intermediate part during the tilting of the sash away from its closed position being held against rotation in relation to the frame part until the rotation of the sash part in relation to the intermediate part has been terminated.

4,359,806

APPARATUS FOR AXIAL SHIRRING OF PLASTIC TUBULAR MATERIAL, ESPECIALLY ARTIFICIAL CASING FOR SAUSAGE MANUFACTURE

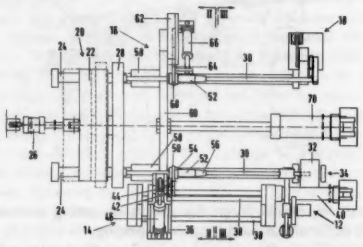
Gunter Kollross, Am Wallerstadter Weg 20, D-6081 Dornheim, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,259

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924059

Int. Cl.³ A22C *13/02*

U.S. Cl. 17—1 R **17 Claims**



1. An apparatus for axial shirring of tubular material, such as artificial casing for sausage manufacturing, comprising:

a turret means comprising at least two shirring tubes extending therefrom substantially parallel to each other, said turret means being movable to bring each of said shirring tubes, one at a time, to a shirring position,

a shirring tool positioned to cooperate with the shirring tube located at the shirring position, said shirring tool being non-axially movable relative to the axis of the shirring tool,

a stop member axially slidably disposed on each shirring tube,

and means for moving the stop member along the shirring tube, during the shirring operation, first towards and then controllably away from the shirring tube, as it receives shirred tubular material, while the shirring tube itself remains stationary against axial movement.

4,359,807

MEAT GRISTLE PULLER

Frank L. Adkison, West Liberty, and Jack L. Kress, Wilton, both of Iowa, assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Apr. 28, 1981, Ser. No. 258,042

Int. Cl.³ A22C *21/00*

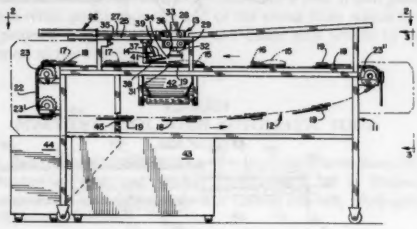
U.S. Cl. 17—1 R **20 Claims**

1. An apparatus for removing gristle from cuts of meat, wherein the apparatus comprises:

support means;

conveyor means affixed to said support means, said conveyor means having a tray member for supporting a cut of meat, said tray member traversing a longitudinal path;

a hold down assembly movably mounted on said support means at a location above a preselected length of said conveyor means and for cyclical general alignment with and



operative interengagement of said tray member to sandwich a portion of gristle of a cut of meat therebetween; and

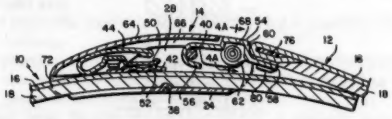
wedging jaw means attached to said support means at a location along said preselected length, said wedging jaw means being for generally intersecting said longitudinal path of the tray member and for permitting passage of the gristle while preventing passage therethrough of the cut of meat on said tray member to thereby remove said gristle from the meat.

4,359,808

ADJUSTABLE LENGTH STRAP WITH NON-EXPANSIBLE NON-METALLIC STRAP MEMBERS INTERCONNECTED BY A METALLIC COUPLING DEVICE

Raymond C. Fontaine, Greenville, R.I., assignor to Textron, Inc., Providence, R.I.

Filed Jan. 28, 1980, Ser. No. 116,157
Int. Cl.³ A44B *11/25*
U.S. Cl. 24—71 R **18 Claims**



1. A strap for attaching a watch or other jewelry article to the wrist of a wearer, comprising: first and second non-expansible elongated flexible strap members interconnected by a coupling device which is adapted to accommodate adjustment of the overall strap length, at least one of said strap members having a strap adaptor permanently secured thereto, said strap adaptor having tab means protruding therefrom, a connector element forming part of said coupling device, said tab means protruding into receiver means in said connector element and being bendably deformed into overlapped engagement with said connector element to detachably secure said coupling device to the said one strap member.

4,359,809

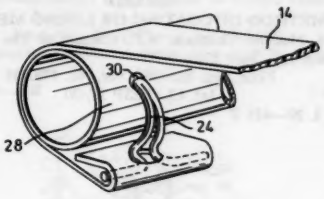
TUBULAR FURNITURE CONSTRUCTION

Graham Fraser, Lindsay, Canada, assignor to Lindsay Specialty Products Limited, Lindsay, Canada

Filed Mar. 24, 1981, Ser. No. 246,930
Int. Cl.³ A47C *31/02*
U.S. Cl. 24—265 C **4 Claims**

1. A clip for clipping an edge of a web to a tubular frame comprising a single piece of wire bent into a T-shape in front elevation having a T-bar constituted by two end portions of the piece of wire and a T-stem extending downwardly from the T-bar;

said T-stem in side elevation of said clip having a hook section that extends from said T-bar and a C-shaped hole



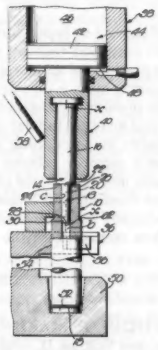
searching lead section, the hook section and the lead section merging in a U-bend, the C-shaped hole searching lead section being adapted to engage with the inside of a tube wall to be retained against movement relative to the tube wall in use.

4,359,810

METHOD OF FORMING CARTRIDGE CHAMBERS IN FIREARM BARRELS

William E. Osborne, Guilford; Arthur H. Burns, Jr., Hamden, and James M. O'Keefe, Cheshire, all of Conn., assignors to The Marlin Firearms Company, North Haven, Conn.

Filed Jan. 16, 1980, Ser. No. 112,558
Int. Cl.³ B21J *13/08*
U.S. Cl. 29—1.1 **8 Claims**



1. Method of forming a cartridge chamber in the bore of a barrel with a punch having a shank with a free end, a shoulder surrounding said shank and spaced from said end, and a junction between said shank and shoulder, of which said shank is substantially cylindrical about an axis except for being tapered over an endlength to said end, said shoulder lies in a plane substantially normal to said axis, and said junction is of the specified cross-sectional shape of the mouth of the cartridge chamber, with said shank, and junction having a continuous and exposed polished surface throughout, and said shank being intermediate said tapered endlength thereof of a diameter equal to that of the barrel bore, said method comprising forcing the punch with its shank end leading into the bore of the barrel from the butt end thereof until said shoulder rests on the butt end of the barrel and then retracting the punch from the barrel through the butt end thereof, whereby the mouth and peripheral wall of the cartridge chamber are formed into precise form-fit with said punch over its forced contact with the barrel

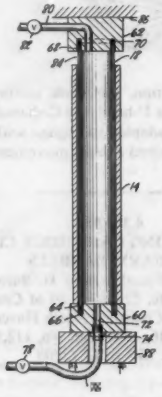
bore, and the polished surface of said shank and junction will, in conjunction with the operation friction between the barrel bore and the shank and junction therein, generate a continuous and uniformly polished surface finish on the mouth and peripheral wall of the cartridge chamber.

4,359,811

METHOD OF COATING OR LINING METALS

Paul S. Monroe, Chatham, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Aug. 20, 1980, Ser. No. 179,929
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—421 R **3 Claims**



1. A method of coating or lining normally corrodible tubular metal shapes with corrosion-resistant metal coatings or linings which comprises placing the tubular metal shape in concentric telescopic relationship with a tubular shape of the corrosion-resistant metal to provide an assembly consisting of an inner tubular member and an outer tubular member, closing the ends of the inner member but permitting unrestricted axial movement of said inner member relative to said outer member, introducing a liquid into the interior of the inner member to fill said member, and freezing said liquid while confined in said inner member, whereby the outer wall of said inner member is expanded into firm contact with the inner wall of the outer member.

4,359,812

METHOD OF MAKING A JOINT

Norbert P. Haag, and William D. Irish, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 14, 1981, Ser. No. 224,991
Int. Cl.³ B23P *3/00, 25/00*
U.S. Cl. 29—458 **8 Claims**

1. A method of making a joint between a small diameter metal tube and a large diameter metal tube comprising the steps of:

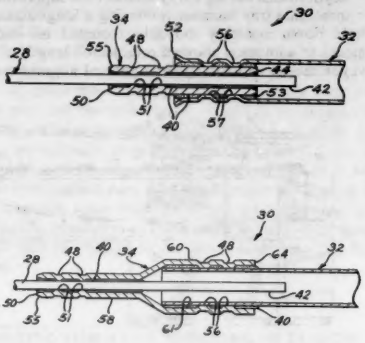
coating the outside of the small diameter tube with an adhesive;

inserting the coated small diameter tube through a hollow cylindrical sleeve made of metal having the same or greater thermal coefficient of expansion as the small diameter tube, and extending beyond the ends of said hollow sleeve;

deforming an area of the hollow sleeve circumferentially to displace the adhesive in the deformed area and make metal-to-metal contact between the sleeve and the small diameter tube;

coating at least a portion of the sleeve with an adhesive;

positioning one of the sleeve or large diameter tube around the other with said one having a thermal coeffficient of expansion the same or greater than the other, and



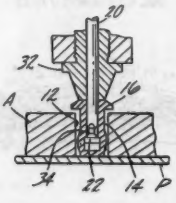
deforming an area of said one of the sleeve or large diameter tube circumferentially to displace the adhesive in the deformed area and make metal-to-metal contact between the large diameter tube and the sleeve.

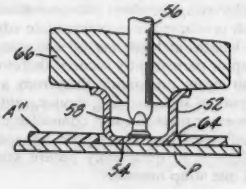
4,359,813

METHOD OF FASTENING

Dieter Mauer, Lollar, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Division of Ser. No. 57,252, Jul. 13, 1979, Pat. No. 4,261,245, which is a division of Ser. No. 855,606, Nov. 29, 1977, Pat. No. 4,189,978. This application Nov. 13, 1980, Ser. No. 206,343
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2656130
Int. Cl.³ B21D *35/00*
U.S. Cl. 29—469.5 **11 Claims**





1. A method of securing an article to a support, without making a hole in the support, by means of a fastener which can be welded or bonded to the support and, while accommodated in an aperture in the article through which it projects, caused to effect clamping of the article to the support, characterized by providing a fastener comprising a tubular shank and a centrally disposed pin, part of which is accommodated in the shank and part of which projects from the shank at the oppo-

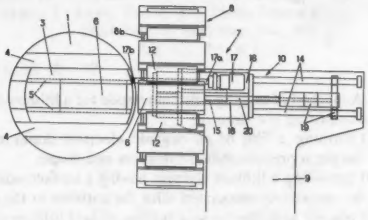
site end of the fastener from that which is to be welded or bonded to the support, anchoring the pin to the shank at a locality remote from the end from which the pan projects so that pulling of the pin against reaction of an anvil bearing on the shank at that end effects deformation of the shank to set the fastener, welding or bonding the fastener to the support with the shank of the fastener accommodated in an aperture in the article and setting the fastener by means of a tool which pulls the pin while pushing on the end of the shank from which the pin projects to set the fastener and cause said article to be clamped to the support.

4,359,814

MACHINE TOOL WITH AUTOMATIC TOOL CHANGING

Jean-Rene Pihery, Ulis-Bures-sur-Yvette; Jean-Pierre Sanguiol, Meudon-la-Foret, and Michel Turlet, Paris, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jul. 28, 1980, Ser. No. 172,741
Claims priority, application France, Jul. 31, 1979, 79 19710
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **9 Claims**



1. Machine tool apparatus with automatic tool changing, comprising,

a head which during machining operations is rotated about an axis and carries a cutting tool movable transversely to said axis,

an indexable rotatable drum for carrying a plurality of tool holders,

a plurality of tool holders which are transferrable between the head and said drum, said tool holders including base plates which have dovetailed profiles,

said head having a carriage which is radially movable thereon, said carriage being provided with dovetailed guide means for receiving the base plates of said tool holders,

said drum having an axis of rotation which is perpendicular to the axis of rotation of said head, said drum having circumferentially spaced dovetailed guide means for receiving the base plates of a plurality of said tool holders,

transfer means for slidably transferring tool holders from the carriage to the drum and vice versa, said transfer means being operable to move the tool holders parallel to the axis of rotation of the drum,

clamping means for clamping said tool holder to the carriage, said clamping means including a plurality of rods mounted in the carriage on one side of the dovetailed guide thereof, each of said rods having a trapezoidal notch with an inclined surface for bearing against the guide of the tool holder base plate, springs for urging the inclined surfaces of the notches into clamping engagement against the guide of the tool holder base plate, an axially movable shaft, said shaft and said rods having mutually contacting inclined surfaces which move said rods along their axes in response to movement of the shaft along its axis,

and means for operating the clamping means to clamp and unclamp the tool holders to and from the carriage,

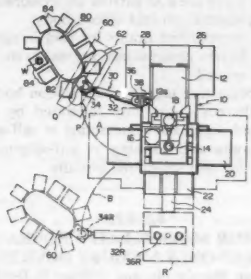
said transfer means and said means for operating the clamping means being spaced from the drum to avoid interference with the rotational movement of the drum.

4,359,815

MACHINING CENTER WITH A ROBOT

Kenichi Toyoda, Hino, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Nov. 10, 1980, Ser. No. 205,157
Claims priority, application Japan, Nov. 8, 1979, 54-143804
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **3 Claims**



1. A machining center for automatically effecting machinings to a workpiece supplied from a workpiece supply table disposed on a floor in a vicinity of the machining center, comprising:

a machine body including a rigid column, a vertical spindle head attached to said rigid column and incorporating therein a vertical spindle to which a cutting tool is removably fitted, and a work table on which a workpiece is removably mounted;

a tool storing magazine fixed to said machine body for removably storing therein a plurality of cutting tools, and;

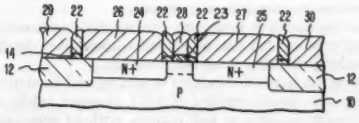
a robot device integrally mounted on said machine body and movable for effecting a tool exchange between said tool storing magazine and said vertical spindle and a workpiece exchange between said workpiece supply table and said work table of said machine body.

4,359,816

SELF-ALIGNED METAL PROCESS FOR FIELD EFFECT TRANSISTOR INTEGRATED CIRCUITS

Shakir A. Abbas, Wappingers Falls, and Ingrid E. Magdo, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 8, 1980, Ser. No. 167,253
Int. Cl.³ H01L *21/22*
U.S. Cl. 29—571 **28 Claims**



1. A method for forming field effect transistor integrated circuits having a pattern of narrow dimensioned dielectric regions on a monocrystalline silicon body comprising:

providing said silicon body of an appropriate conductivity;

forming a first insulating layer on a major surface of said body;

forming on said layer a polycrystalline silicon layer;

forming openings in said polycrystalline silicon layer by reactive ion etching in the areas designated to be the gate

regions of said integrated circuits which results in the structure having substantially horizontal surfaces and substantially vertical surfaces;

forming a second insulating layer on both said substantially horizontal surfaces and said substantially vertical surfaces;

reactive ion etching said second insulating layer to substantially remove said second insulating layer from said horizontal surfaces and to provide said narrow dimensioned dielectric regions on said silicon body;

thermally oxidizing the surface of said silicon body between certain of said narrow dimensioned regions to form the gate dielectrics for said integrated circuits;

removing the remaining said polycrystalline silicon layer by etching to leave the said narrow dimensioned regions and said gate dielectric on said silicon body;

forming the sources and drains for said integrated circuits using said narrow dimensioned regions as the mask for the said forming; and

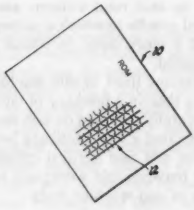
forming a conductive layer on said silicon body which has portions thereof electrically separated by said narrow dimensioned regions for contacting in self-alignment the sources, drains and forming in self-alignment the gate electrodes for said integrated circuits.

4,359,817

METHOD FOR MAKING LATE PROGRAMMABLE READ-ONLY MEMORY DEVICES

John E. Dickman, Russiaville, and William B. Donley, Kokomo, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 28, 1981, Ser. No. 268,090
Int. Cl.³ H01L *21/22*
U.S. Cl. 29—571 **5 Claims**



1. A method of making a high speed and high density IGFET read-only memory and encoding it late in said method comprising:

forming a grid of gate thickness dielectric on a semiconductor surface within an area covered by a field thickness dielectric;

forming a pattern of diagonally disposed gate lines on said grid to provide an array of operative IGFET channels interconnecting semiconductor input and output regions;

covering said area with a first insulating coating that has contact openings to said regions;

covering said first insulating coating with a second insulating coating that can be etched without also significantly etching said first insulating coating;

etching ion implant windows in said second insulating coating over predetermined IGFET channels while etching contact openings to said regions, without penetrating the first insulating coating over said channels;

significantly altering threshold voltage of said predetermined channels but not the balance of said channels by an ion implantation that only penetrates said second insulating coating by passing through said windows, so as to encode said array;

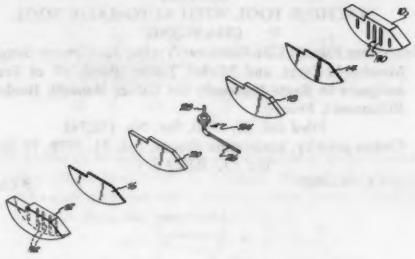
providing a pattern of conductor lines on said second insulating coating that are diagonally disposed with respect to said grid orthogonally disposed with respect to said gate lines and which do not cross said ion implant windows, effective to provide a high density read-only memory without drain lines overlapping said ion implant windows and producing undesirable capacitances to slow down memory operation.

4,359,818

COATED ANODE FOR LITHIUM HALOGEN CELLS

Robert A. Zayatz, North Tonawanda, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,499
Int. Cl.³ H01M *2/14, 2/18*
U.S. Cl. 29—623.1 **11 Claims**



1. A method of making a lithium anode for a lithium-halogen cell comprising the steps of:

(a) forming a film of an organic electron donor material having a predetermined thickness and shape;

(b) providing a lithium element having a surface adapted to be operatively associated with the cathode in the cell;

(c) placing said film on said surface of said lithium element;

(d) applying pressure to bond said film to said surface of said lithium element; and

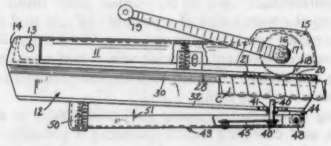
(e) said step of applying pressure comprising providing a pair of mold sections, placing said film and lithium element between said mold sections and bringing said mold sections together and against said film and lithium element, and applying pressure through said mold sections to said film and lithium element.

4,359,819

QUICK CLAMPING DEVICE TO HOLD BX CABLES

Lucien C. Ducret, 28 Lockwood Dr., Old Greenwich, Conn. 06870

Filed Aug. 13, 1981, Ser. No. 292,356
Int. Cl.³ B21F *13/00*
U.S. Cl. 30—90.3 **7 Claims**



1. A hand tool for cutting the shielding of a shielded conduit comprising:

a first elongated handle member having a hinge end and a free end;

a circular saw carried by said first member adjacent its free end in a position such that its cutting plane is parallel to the longitudinal axis of said first member;

a second elongated handle member defining a cable-receiving channel, having a hinge end and a free end, hingedly connected to said first member at the hinge ends of said

members, and being provided with a longitudinally disposed slot which is adjacent the free end of said second member and lies in the cutting plane of the circular saw;

stop and guide means between said first and second members, adapted to control and delimit the relative hinging movement of said members;

a third elongated member disposed substantially parallel to the second member and hingedly connected thereto adjacent the free end thereof;

cable clamping means carried by said third member and being movable thereby toward and away from cable clamping position; and

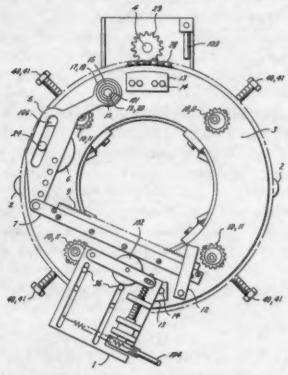
means for limiting the movement of said third member.

4,359,820

PIPE CASING CUTTER

Lionel H. Wheeler, 7654 Hereford, Houston, Tex. 77087, and James P. Adair, Rte. 3, Box 234B, Leander, Tex. 78641

Filed Nov. 3, 1980, Ser. No. 203,787
Int. Cl.³ B26D *3/16*
U.S. Cl. 30—97 **9 Claims**



1. A pipe cutter, comprising:

attachment means for implacement on the pipe to be cut;

power means connected to the attachment means;

cutting means for cutting the pipe, the cutting means movably connected to the attachment means;

revolution means for revolving the cutting means around the pipe;

application means for applying the cutting means to the pipe, wherein said application means comprises:

a lower roller chain mounted to the attachment means;

a crank plate sprocket in communication with the lower roller chain;

a crank plate assembly attached to said crank plate sprocket and mounted to the revolution means so that the crank plate assembly revolves about its own axis upon rotation of the revolution means, and;

a crank arm assembly and cam follower attached to the crank plate assembly for transforming the revolution of the crank plate assembly into lateral movement of the cutting means; and

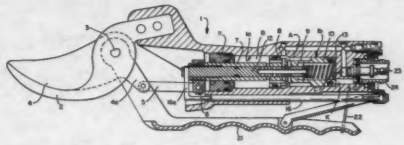
adjusting means for adjusting the cutting force of the cutting means.

4,359,821

HYDRAULIC SECATEUR OR PRUNING SHEARS HAVING A DEVICE FOR CONTINUOUSLY CONTROLLING THE SEPARATION OF ITS CUTTING BLADES

Roger J. P. Pellenc, Pertuis, France, assignor to Etablissements Pellenc & Motte, Pertuis, France

Filed Nov. 6, 1980, Ser. No. 204,795
Claims priority, application France, Nov. 13, 1979, 79 28269
Int. Cl.³ B26B *15/00*
U.S. Cl. 30—228 **13 Claims**



1. A hydraulic-assisted secateur adapted for cutting or harvesting in arboriculture, viticulture and horticulture, said secateur comprising a body having a front end, a rear end, and two cutting blades attached to said body adjacent to said front end, at least one of said blades being a pivoting blade which is adapted to be driven by a hydraulic device, a drive piston having a shaft secured to said pivoting blade, said shaft being slidable within an opening in said body and said piston comprising opposed work faces, said work faces defining a portion of enclosed first and second chambers, respectively, said first chamber being in constant fluidic communication with an inlet for pressurized hydraulic fluid which is adapted to be attached to said body, a distributor drawer, and fluidic distribution means adapted to control the movement of said piston within said body opening, said distributor drawer being slidably positioned within said piston and within said shaft and being indirectly connected to a trigger, said secateur including means for setting and maintaining said blades in a predetermined position, which position may comprise any position between an entirely open position of said blades and an entirely closed position of said blades.

4,359,822

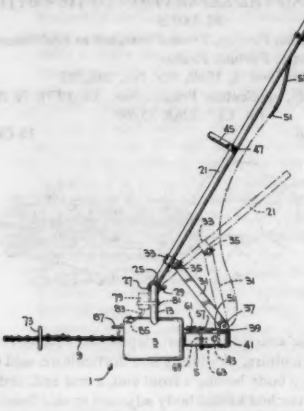
POWER CHAIN SAW HANDLE ATTACHMENT

John P. Kolodziejczyk, Rte. 2, Box 378A, Ironwood, Mich. 49938

Filed Mar. 15, 1979, Ser. No. 20,633
Int. Cl.³ B27B *17/00*
U.S. Cl. 30—296 R **3 Claims**

1. A power chain saw including, in combination, a chain saw having a body, a handle projecting from one end thereof, and a cutting bar and cutting teeth projecting from the other end thereof, and said power chain saw body having an auxiliary handle supporting element fixed thereto and said element including a transverse member in a plane above and transversely positioned with respect to a projected plane of said cutting bar when said cutting bar is in horizontal position with respect to the ground, rigid members connected to opposite ends of said transverse member and depending therefrom and connected at their lower ends to the body of the saw thereby spacing the transverse member in a plane above the body of the power chain saw, and an upstanding auxiliary handle detachably fixed to said transverse member said auxiliary handle includes means mating with said transverse member and clampable thereto so that said means and upstanding auxiliary handle may be pivoted with respect to the transverse member for adjusting the angular relationship of said handle with re-

spect to said transverse member, the auxiliary handle extending from said supporting element for controlling the operation of



said power chain saw when said cutting bar is in horizontal position with respect to the ground.

4,359,823

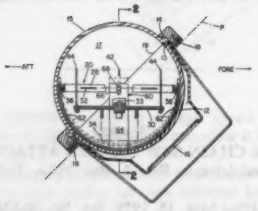
GRAVITY ADJUSTED COMPASS

Wilfrid G. White, Eight Sterling Dr., Dover, Mass. 02030

Filed Dec. 22, 1980, Ser. No. 218,644

Int. Cl.³ G01C *17/08*

U.S. Cl. 33—364 **4 Claims**



1. In a spherical compass having, positioned within a pair of hemispherical bowls joined together in a plane, a double axis gimbal system having an outer athwartships axis, a fore and aft axis, fore and aft lubber lines and a rotatably mounted compass card supported therein, that improvement which comprises

gravity operated gimbal support means for automatically positioning said double axis gimbal system into a horizontal plane for selective mounting of said compass with its athwartships gimbal system axis mounted horizontally and its fore and aft compass mounting plane oriented at any angle between the horizontal and vertical

said support means comprising

a gimbal support unit mounted within said bowls for limited vertical movement from a normal lowered position in frictional damping contact with the inner surface of the lower of said hemispherical bowls to a raised position of reduced frictional contact for gravity adjustment of said gimbal system fore and aft axis and said fore and aft lubber lines into a horizontal plane.

4,359,824

PROTRACTOR UNIT FOR DRAWING-BOARD

Alain Bruneau, Montferrand le Chateau, France, assignor to Alpia S.A., France

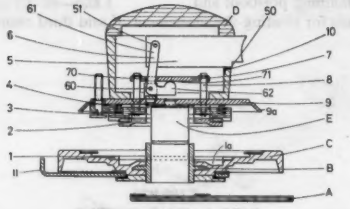
PCT No. PCT/EP79/00034, § 371 Date Jan. 15, 1980, § 102(e) Date Jan. 15, 1980, PCT Pub. No. WO79/01076, PCT Pub. Date Dec. 13, 1979

PCT Filed May 11, 1979, Ser. No. 194,298

Claims priority, application France, May 16, 1978, 78 15004

Int. Cl.³ B43L *13/08*

U.S. Cl. 33—438 **7 Claims**



1. Protractor unit for a drawing board, comprising a support having a bearing socket, an annular recess around said bearing socket and a first annular gear adjacent said recess and concentric with said bearing socket, said gear having radial teeth, a rule carrier below said support, a handle above said support, a hub extending through said bearing socket and connecting said rule carrier with said handle, and a second annular gear fixed to said handle concentric with said bub and receivable in said annular recess of said support, said second annular gear having the same number and spacing of radial teeth as said first annular gear, and a movable third annular gear facing and concentric with said first and second annular gears and having the same number and spacing of radial teeth, and means for moving said third annular gear between an engaged position in which it meshes with said first and second annular gears to lock said first and second gears together and consequently to lock said handle and rule carrier in a selected angular position relative to said support and a disengaged position in which said handle and rule carrier are rotatable relative to said support.

4,359,825

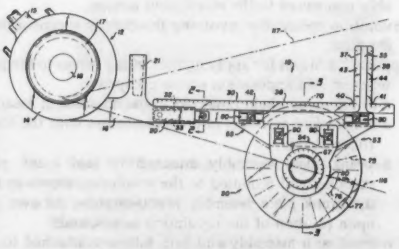
DRAFTING MACHINE ATTACHMENT

Jerroll C. Erickson, 3912 Joyce Ave., Powell River, British Columbia, Canada

Filed Mar. 9, 1981, Ser. No. 241,608

Int. Cl.³ B43L *13/02*

U.S. Cl. 33—438 **9 Claims**



1. An attachment for a drafting machine mountable on a drawing board and having a protractor head fitted with a chuck, said attachment comprising a scale adapted to be fitted to the chuck and located by operation of the protractor head in a first position and a second position disposed at a predeter-

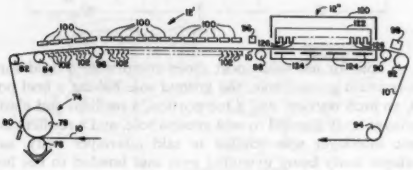
mined acute angle to said first position, said scale having a ruling edge and an index point on said edge usable when the scale is in the first position to mark the location for placement of a required symbol, a template having a plurality of symbol outlines, mounting means supporting the template on the scale for rotation about an axis perpendicular to the drawing board, and an indicator on the mounting means for locating a required symbol outline in a position to coincide with the marked location when the scale is moved to the second position.

4,359,826

DRYING SYSTEM

Robert R. Rounsley, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 21, 1980, Ser. No. 132,442
Int. Cl.³ F26B 7/00, 20/00
U.S. Cl. 34—1 11 Claims



7. A method for removing volatile liquid from a liquid bearing web of material by evaporation, comprising the steps of:

(a) moving a liquid bearing web of material through a drying station,

(b) directing heated air against a portion of a first side of said liquid bearing web to effect evaporation of said liquid, and

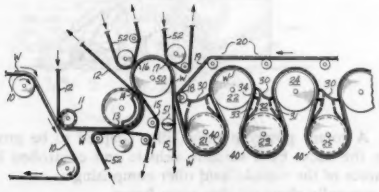
(c) simultaneously subjecting substantially all of said portion of said liquid bearing web of material to a static electrical field provided by electrostatic means comprising a plurality of electrodes positioned at said drying station along said web on a second side thereof opposite said first side, and means for supplying a first static electrical potential to selected ones of said electrodes and for supplying a second static electrical potential to the others of said electrodes, whereby evaporation of said liquid from said web is enhanced by simultaneously subjecting substantially all of said portion of said web to both heated air and a static electrical field.

4,359,827

HIGH SPEED PAPER DRYING

Keith V. Thomas, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 91,684, Nov. 5, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 234,288
Int. Cl.³ F26B 3/24
U.S. Cl. 34—16 15 Claims



1. In a papermaking process of the type wherein a paper web is dewatered by passage through a press nip and dried by a series of heated cylinders, the improvement, wherein velocity and other paper machine related stresses that typically operate on the web to limit production speed are substantially eliminated, comprising:

transporting said web on supporting means from the press nip through a series of heated cylinders;

drying said web by contacting it directly and indirectly with said series of heated cylinders; and

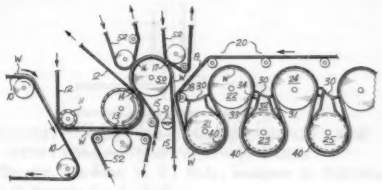
holding said web onto its supporting means by employing forces normal to the major web surfaces sufficient to overcome velocity-related stresses on all portions of the web during said transportings, at least until said web has attained sufficient strength through drying to be self-supporting at the speed selected.

4,359,828

VACUUM BOX FOR USE IN HIGH SPEED PAPERMAKING

Keith V. Thomas, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 91,211, Nov. 5, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,313
Int. Cl.³ F26B 13/08
U.S. Cl. 34—114 11 Claims



1. In a paper machine of the type having drying cylinders to dry a paper web and a supporting fabric means for transporting the web in partial wrapping direct and indirect contact with the heated cylinders, an improved vacuum box means for holding said web to said fabric means on all portions of said web where said web would otherwise be subjected to velocity forces in traveling from cylinder to cylinder and about fabric-wrapped cylinders, said vacuum box, comprising:

a fixed surface means for deflecting machinery-generated air currents from impinging upon the paper web and supporting dryer fabric, said surface extending, across the width of the paper machine, substantially between adjacent web-wrapped cylinders, the leading edge of which surface, with respect to machine direction, leads the line of departure of said web and fabric from the web-wrapped cylinder and the trailing edge of said surface extends at least until said web and fabric contact the subsequent web-wrapped cylinder;

end wall means for preventing air flow into the ends of said vacuum box, said walls coincident with the outer machine direction edges of the fixed air deflecting surface means, said walls extending closely adjacent to said fabric-wrapped cylinder, and extending adjacent the web-supporting fabric traveling between the web- and fabric-wrapped cylinders but sufficiently distant from said fabric that paper web waste passing between cylinders and said wall cannot cause said fabric to contact said wall;

sealing means, between said vacuum box and said fabric and cylinders, for limiting air leakage into said box while permitting the passage of waste paper between said box and drying cylinders without damage to said box, fabric or sealing means; and

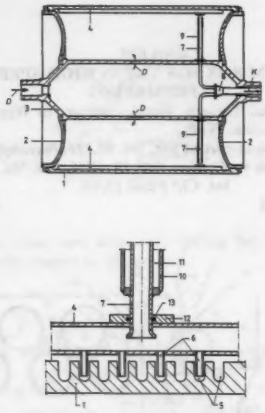
a means for causing the pressure differential in said vacuum box sufficient to hold said web to said supporting fabric.

4,359,829

DRYING CYLINDER FOR PAPER MAKING MACHINE

Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Fed. Rep. of Germany

Filed Nov. 20, 1980, Ser. No. 208,786
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948203
Int. Cl.³ F26B 13/08
U.S. Cl. 34—124 27 Claims



1. A drying cylinder for a paper making machine, or the like, comprising:

a hollow casing, including an external cylinder surface and an inner surface; the inner surface being shaped to define grooves therein and the grooves extending circumferentially around the inner surface;

a vapor inlet to the casing; a siphoning arrangement for extracting condensate from the grooves, the arrangement comprising:

at least one condensate collector located inside and extending axially of the casing; a siphon pipe connected to the condensate collector for drawing condensate out of the collector through the pipe; the grooves being defined along the casing, both in the vicinity of the siphon pipe and in the region away from the siphon pipe;

thermal insulation means for the siphon pipe for reducing the exchange of heat between the outside and inside of the siphon pipe and for reducing deposition of condensate on the external surface of the siphon pipe;

a plurality of suction pipes at spaced intervals along the collector and communicating into the collector, and each suction pipe projecting into one of the grooves for suctioning condensate out of the grooves;

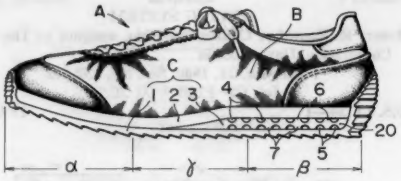
the presence of the thermal insulation on the siphon pipe and the shape and position of the suction pipes being such that the drying performance of the cylinder on a paper web, or the like, in the vicinity of the siphon pipe is adapted to the drying performance of the cylinder on a paper web, or the like, along the remainder of the length of the casing for avoiding damp stripes on the web in the vicinity of the siphon pipe.

4,359,830

SPORT SHOE SOLE

Masanobu Inohara, Akashi, Japan, assignor to Asics Corporation, Akashi, Japan

Division of Ser. No. 896,477, Apr. 14, 1978, Pat. No. 4,236,326.
This application Aug. 4, 1980, Ser. No. 174,848
The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.
Int. Cl.³ A43B 13/20, 21/28
U.S. Cl. 36—29 2 Claims



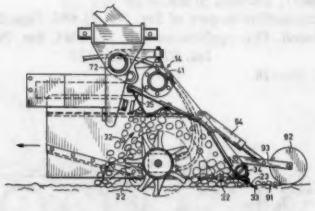
1. A sole for use with sport shoes comprising a rigid abrasion-resistant ground sole, the ground sole having a heel portion, an arch portion, and a toe portion, a resilient and elastic interlayer body bonded to said ground sole, and a resilient and elastic interlayer sole bonded to said interlayer body, said interlayer body being extended over and bonded to the heel portion and the shoe arch portion of the ground sole and having uniform thickness at the heel portion and decreasing into a wedge shape toward the top of the shoe arch portion, the interlayer body being provided with a plurality of parallel, transversely extending grooves being provided only on the lower surface of said interlayer body from its one side to its opposite side, the cross section of each groove being semi-circular so as to have uniform distribution of stress, preferred absorbing power of impact load, and a durable shape, the resilience of the interlayer body and the interlayer sole and the air in the grooves permitting preferred absorption of impact load exerted against the heel portion of the sole at the time of landing and good restoration and long durability of arched shapes.

4,359,831

REVERSIBLY POWERED ROTARY SNOW TILLER

Michael G. Beeley, Logan, Utah, assignor to De Lorean Manufacturing Company, Bloomfield Hills, Mich.

Filed May 19, 1980, Ser. No. 151,427
Int. Cl.³ E01H 5/00
U.S. Cl. 37—258 37 Claims



1. A rotary powered snow tiller adapted to be propelled over the snow by a suitable vehicle and controlled by the operator of the vehicle, said tiller comprising:

a generally elongate tiller main frame;

an elongate generally rigid snow cutter assembly secured rotatably generally at each of its ends to the main frame and having a multiplicity of outstanding snow cutting teeth, said cutter further having two elongate cutter segments of generally equal length; and flexible bushing

means connecting the two cutter segments generally coaxially together in lateral and rotational flexing relationship;

a pair of motor means adapted to together rotate the snow cutter assembly, a one of said pair secured to the main frame in the vicinity of each one of the ends of said assembly; and

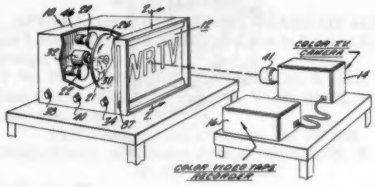
a snow directing apron mounted upon the frame generally over the cutter assembly substantially the full length thereof and extending rearwardly downward to a generally horizontal trailing edge.

4,359,832

LIGHT POLARIZING LAMINATION AND SYSTEM EMPLOYING SAME

Francis L. Woolley, Jr., 1513 Durwood Ct., Reading, Pa. 19609

Filed Sep. 11, 1980, Ser. No. 185,723
Int. Cl.³ G09F *13/00*
U.S. Cl. 40—434 **15 Claims**



1. A lamination responsive to polarized light of varying direction of polarization applied to a side thereof to produce at its opposite side a light image presenting the illusion of motion of at least parts thereof, comprising the assembly of:

a polarizing layer at least portions of which are light-transmissive and are polarized in different directions;

a depolarizing layer of light-transmissive material having the characteristic of substantially randomizing the polarization directions of polarized light passing through it and overlying one side of the polarizing layer; and

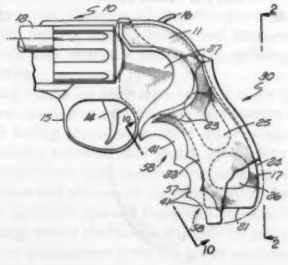
an artwork transparency positioned on the same side of the polarizing layer as the depolarizing layer, said artwork transparency containing image-forming areas of different visual appearances optically aligned with corresponding different ones of said light-transmissive portions of said polarizing layer.

4,359,833

REINFORCED CUSHIONING GRIP FOR PISTOLS

Frank A. Pachmayr, Los Angeles, and Jack R. Farrar, Whittier, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed Sep. 10, 1980, Ser. No. 185,759
Int. Cl.³ F41C *23/00*
U.S. Cl. 42—71 P **15 Claims**



1. A gun grip comprising:

two grip sections each including a body of elastomeric material and a reinforcing plate embedded in and more rigid than said elastomeric material;

said bodies of elastomeric material forming two side panels to be received at opposite sides respectively of a gun handle, two front flanges of said elastomeric material projecting inwardly toward one another from forward edges of said panels respectively at locations to be received in front of said handle, and two rear flanges of said elastomeric material projecting inwardly from rear edges of said panels and toward one another at locations to be received in back of said handle;

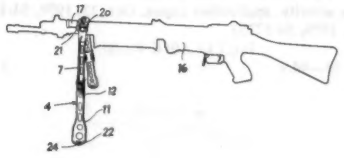
said reinforcing plates having main portions embedded in and reinforcing said side panels of the elastomeric material, forward portions projecting inwardly toward one another within said front flanges of the elastomeric material at locations to be received in front of said gun handle, and rear portions projecting inwardly toward one another within said rear flanges of the elastomeric material at locations to be received behind said gun handle.

4,359,834

MULTIPOSITIONED TWO-LEGGED SUPPORT FOR PORTABLE AUTOMATIC WEAPONS

Pier C. Beretta, Gardone V. T., Italy, assignor to Fabbrica D'Armi P. Beretta S.p.A., Italy

Filed Feb. 2, 1981, Ser. No. 230,436
Claims priority, application Italy, Mar. 7, 1980, 5128 A/80
Int. Cl.³ F41C *29/00*
U.S. Cl. 42—94 **1 Claim**



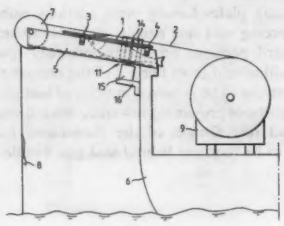
1. A multiposition, two-footed support for portable automatic weapons, said support comprising a sleeve, a pair of laterally extending oppositely directed arms integral with said sleeve, two wings provided at the extremities of said arms each said wing having a lateral arresting tooth and two foldable rods pivotably coupled to said two wings and angularly displaceable from a parallel position to a perpendicular position with respect to the frame of the weapon, said two foldable rods each comprising a first and a second section pivotably connected to their contiguous extremities so as to pass from a position of alignment to a position adjacent the weapon through an angular displacement including a plurality of intermediate positions defined by an arresting lever on one of said sections cooperating with arresting notches provided on the other said section, said second section comprising a resting foot and having a cap shaped terminal with a rim having a cut which serves to receive and couple said lateral arresting tooth of said respective wing when said second section approaches said first element and both sections are rotated so as to position themselves parallel to the side of the frame of the weapon.

4,359,835

APPARATUS FOR DETACHING FISHES FROM FISH-HOOKS ON A FISHING LINE

Thorbjörn N. Christiansen, Vesteralsgt. 1, N-8400 Sortland, Norway

Filed Jan. 7, 1981, Ser. No. 223,060
Claims priority, application Norway, Jan. 17, 1980, 800103
Int. Cl.³ A01K *91/06, 79/00*
U.S. Cl. 43—6.5 **5 Claims**



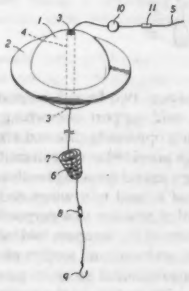
1. An apparatus for detaching fishes from fish-hooks on a fishing line during hauling of the line, characterized in that it comprises a guiding means **(1)** disposed below the line **(2)** and having a guiding edge **(10)** forming an acute angle with the line in the hauling direction thereof and causing arriving fish-hooks **(8)** to slide along the guiding edge when passing the apparatus, and a detachment means **(11)** cooperating with the guiding means **(1)** for detaching fishes hanging on the hooks **(8)** when arriving at the guiding means.

4,359,836

FISHING FLOAT

Kenji Yuji, No. 8-14, Aburatsu 2-chome, Nichinan-shi, Miyazaki-ken, Japan

PCT No. PCT/JP79/00266, § 371 Date Jun. 5, 1980, § 102(e) Date Jun. 5, 1980, PCT Pub. No. WO80/00778, PCT Pub. Date May 1, 1980
PCT Filed Oct. 22, 1979, Ser. No. 224,284
Claims priority, application Japan, Oct. 23, 1978, 53-130627; Mar. 28, 1979, 54-37271
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—44.9 **1 Claim**



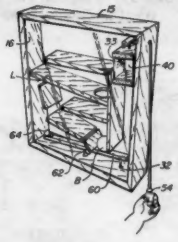
1. A fishing float comprising a float main body generally of a spherical configuration, an annular resistance body horizontally provided to the circumference of said float main body for increasing the water resistance when pulled into water, a directional stabilizer plate vertically mounted at one side of said float main body for regulating the direction of the float along the wind and tide flow, a small weight piece provided to said directional stabilizer plate for causing said resistance body to take an upright attitude in a state where a weight attached to a fishing line is not completely sunk, and an aperture is formed in said resistance body at the portion opposite the directional stabilizer plate for passing the fishing line therethrough and a mount is attached at the lower end of said float main body for mounting a connecting member for connecting the fishing line thereto.

4,359,837

LABYRINTH CRIB TOY

Sherman W. Hool, 1617 - 4th St., San Rafael, Calif. 94901

Filed Dec. 22, 1980, Ser. No. 219,403
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—43 **3 Claims**



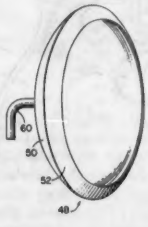
1. In a gravitational labyrinth toy having a circuitous group of passageways defining a path for a ball extending between a ball unloading station at the top portion of said labyrinth and a ball loading station at the bottom portion of said labyrinth, with an elevator for transporting said ball upwardly between said stations, the improvement in said loading station comprising: a balanced pivot lever disposed proximate said ball loading station, said balanced pivot lever having a medial pivot, a first end with a weight thereon, a second end for moving into the path of said ball, said first end having sufficient mass to maintain said second end of said balanced pivot lever in an obstructing position to said loading station to prevent movement of said ball to said loading station, said second end of said balanced pivot lever defining an obstructing upslope path for halting the downward passage of said ball in said gravitational labyrinth; said elevator and ball having sufficient mass to overcome the bias of said first end and cause said balanced pivot lever to pivot so that said second end defines a loading downslope path for permitting said ball to move into said elevator when said elevator is present at said loading station.

4,359,838

MIST SHIELD WATERING CAN

Stephanie M. Dooley, 1009 Broadway, Rockford, Ill. 61104

Filed Aug. 20, 1980, Ser. No. 179,680
Int. Cl.³ A01G *25/00*
U.S. Cl. 47—1 R **3 Claims**



1. A mist shield watering can for house plants comprising a body assembly including a mist sheild having a dished, con-

cave surface, liquid discharge means formed in said mist shield at the lowest point of said dished concave surface, said liquid discharge means including a spout of hollow construction extending outwardly below the mist shield, and liquid retaining means formed on at least two opposing peripheral edges of said mist shield and extending a distance at least equal to the width of said mist shield, said liquid retaining means including an inturned flange, the edge of said inturned flange being spaced above the surface of said mist shield, said inturned flange forming an acute angle with said mist shield surface, said mist shield including a surface portion means indented below the remainder of the mist shield surface to provide a path of conduction for liquid from said liquid retaining means to said liquid discharge means.

4,359,839

APPARATUS FOR BURNING BEARD OF SEED

Roger Loiseau, Le Mans, France, assignor to Loiseau Semences, Arnage, France

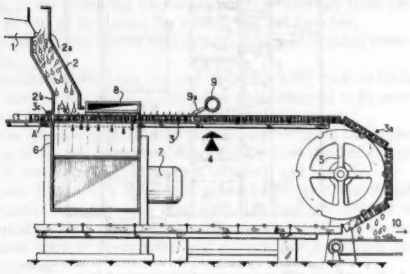
PCT No. PCT/FR79/00128, § 371 Date Oct. 6, 1980, § 102(e) Date Oct. 6, 1980, PCT Pub. No. WO80/01531, PCT Pub. Date Aug. 7, 1980

PCT Filed Dec. 20, 1979, Ser. No. 197,989

Claims priority, application France, Feb. 6, 1979, 79 02969

Int. Cl.³ A01C *1/00*

U.S. Cl. 47—58 **5 Claims**



1. A device for trimming grains each having a caryopsis and an awn projecting therefrom, comprising:

a substantially vertical channel member having a lower portion and an upper portion, said upper portion receiving said grains which fall freely into said upper portion without exact orientation;

a conveyor positioned below the lower portion of said channel member for movement in a substantially horizontal plane, said conveyor including a plurality of spaced essentially vertically oriented elements and a substantially horizontal netting located below and transverse to said elements, said elements and netting defining a plurality of cavities;

blowing means for blowing a current of air upward into the lower portion of said channel, said current of air orienting said falling grains with their awns projecting generally vertically upward, said grains falling into the cavities in said conveyor with their caryopsises contained within said cavities and supported on said netting, the awns projecting vertically upward from said cavities; and

trimming means positioned adjacent to and above said conveyor downstream from the lower portion of said channel member, said trimming means destroying the awns transported thereto by said conveyor without damaging the caryopsises.

4,359,840

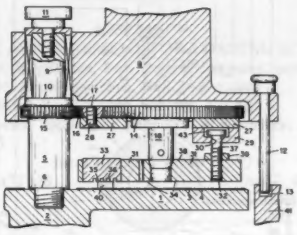
AUTOMATIC GRINDING APPARATUS TO CONTROL UNIFORM SPECIMEN THICKNESSES

Joseph S. Bryner, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 7, 1981, Ser. No. 222,868

Int. Cl.³ B24B *7/22*

U.S. Cl. 51—131.4 **5 Claims**



1. A grinding apparatus for producing substantially flat platelet specimens possessing a substantially uniform thickness comprising:

a. a movable grinding surface attached to a frame,

b. a specimen holder attached to said frame opposite said grinding surface in a plane parallel to said grinding surface, said holder including a stainless steel cylindrical disk having parallel faces which contain multiple cylindrical holes equidistant from the center of said disk and equally spaced about the circumference of said disk, said multiple cylindrical holes containing planar specimen support surfaces at different depths thereby enabling simultaneous grinding of specimens to different uniform thicknesses,

c. means attached to said frame for displacing said holder toward said grinding surface, and

d. at least three means coupled to said holder for limiting displacement of said holder toward said grinding surface by a predetermined distance.

4,359,841

GRINDING WHEEL WEAR DETECTION AND DRESSING METHOD

Charles F. Barth, Parma; Thomas S. Stelson, Richmond Heights, and David E. Blake, Cleveland Heights, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

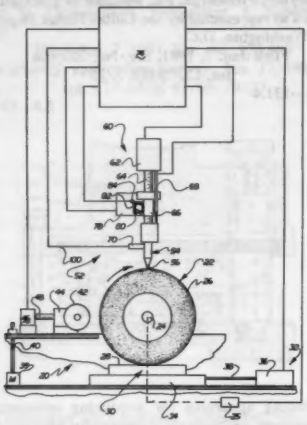
Division of Ser. No. 92,623, Nov. 8, 1979, Pat. No. 4,295,301. This application Apr. 17, 1981, Ser. No. 255,288

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—325 **23 Claims**

1. A grinding wheel wear detection and dressing method comprising the steps of providing a grinding wheel having a circular side surface, rotating the grinding wheel, grinding a workpiece with the grinding wheel, determining a first area on the circular side surface of the grinding wheel where wear will be greater than at a second area on the circular side surface of the grinding wheel during grinding of the workpiece, sensing the extent of actual wear of the grinding wheel at the first area

where wear will be greater than at the second area, and dressing the grinding wheel by removing material from the second



area on the grinding wheel to an extent which is a function of the extent of sensed wear at the first area.

4,359,842

TRAPEZOIDAL STRUCTURES

Rea F. Hooker, 170 W. 74th St., New York, N.Y. 10023

Continuation-in-part of Ser. No. 868,329, Jan. 10, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,904

Int. Cl.³ E04B *1/32*; A63H *33/16*

U.S. Cl. 52—18 **10 Claims**

1. An architectural structure which is a shelter in which trapezoidal elements of a first set are interconnected in pleated relationship with trapezoid and pleat edges thereof coinciding,

trapezoidal elements of a second set are interconnected in pleated relationship with trapezoid and pleat edges thereof coinciding and interfit in connected relationship with and extend transversely to said elements of said first set,

each of said first-set-elements has a short base and a long base, an angled side which makes an acute angle with said long base at a vertex and an obtuse angle with said short base at another vertex, and said bases of all said first-set-elements are parallel and substantially vertical,

said second-set-elements have first sides in common with said angled sides and have vertices, at the ends of said common sides, in common with said actute-and obtuse-angle vertices,

said second-set-elements have bases which extend from said obtuse-angle vertices in a direction transverse to the first-set-element short bases,

said first set, of elements, is arranged in an arc,

said second set, of elements, extends radially from said arc to form a substantially horizontal canopy, cantilevered from said first set, in which said second-set-elements are in a warped, stressed non-planar smooth-curved condition,

said structure having a substantially flat floor adjacent the lower portions of said first-set elements, said floor being secured to said structure so as to provide stability to said structure,

polygonal elements of a third set are interconnected in pleated relationship with polygon and pleat edges thereof coinciding and interfit in connected relationship with said first set, of elements, and extend transversely to said elements of said first set,

said third set-elements have first sides in common with second angled sides of said first-set-elements and have vertices, at the ends thereof, in common with acute-and obtuse-angle vertices of said first-set-elements,

said third-set-elements have second sides which extend from said latter obtuse-angle vertices in a direction transverse to the first-set-element short bases and

said third-set-elements underlie said floor.

4,359,843

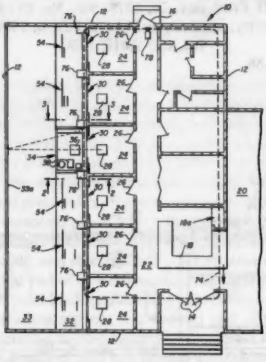
MEDICAL OFFICE CONSTRUCTION

Ronald A. Schachar, 1020 N. Highway 75, Denison, Grayson County, Tex. 75020

Filed Jun. 27, 1980, Ser. No. 163,506

Int. Cl.³ E04H *3/08*

U.S. Cl. 52—29 **7 Claims**



1. A medical office construction, comprising:

a plurality of examining rooms arranged in side by side relationship;

platform means mounted for movement along a path extending along one side of all of said examining rooms for supporting and transporting at least one person together with medical equipment thereon;

a normally closed door mounted in said one side of each examining room;

means associated with said platform for selectively opening said normally closed door of each examining room when said platform means is positioned adjacent thereto to permit movement of persons between said room and said platform means and free access from said room to the medical equipment on said platform means; and

a patient entry door mounted on another side of each examining room.

4,359,844

BIRD PROTECTION APPARATUS

Julius M. Hoggard, and James L. Lane, both of Salt Lake City, Utah, assignors to Utah Power & Light Co., Salt Lake City, Utah

Filed Jun. 2, 1980, Ser. No. 155,578

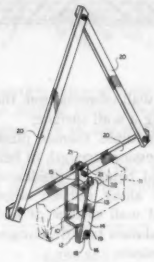
Int. Cl.³ A01K *3/00*

U.S. Cl. 52—101 **5 Claims**

1. A device for installation on the crossbar of an electrical

power pole to prevent birds from landing on the crossbar and accidentally electrocuting themselves by touching adjacent power lines supported by the crossbar, said device being adapted for installation on said crossbar by linemen using hotsticks so that the electrical lines supported by the crossbar need not be deenergized while the device is being installed on the crossbar, said device comprising:

a generally "U"-shaped bracket member adapted to fit around the girth of the crossbar, said bracket member comprising a base member and upper and lower legs, said base member being adapted to be positioned along one lateral side of the crossbar with said upper and lower legs extending from said base member and adapted to be positioned along the top and bottom sides of the crossbar, respectively;



a lug or ear extending outwardly and downwardly from the free end of the lower leg of said bracket member;

a lip on the free end of said upper leg of said bracket member;

an elongate bar having one end bent back over itself to form a hook at said one end, said hook being adapted to fit over said lip on the upper leg of said bracket member;

means for attaching the other end of said elongate bar to the lug or ear which extends downwardly from the free end of the lower leg of said bracket member; and

a planar framework member attached to the upper leg of said bracket member such that when the bracket member is installed on a crossbar, the framework member is in the same plane as the crossbar and extends upwardly from the crossbar.

4,359,845

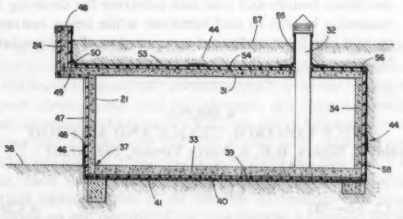
MOISTURE BARRIER SYSTEM FOR EARTH-SHELTERED HOUSING

Bill L. Harrison, 659 S. Prairie St., Frankfort, Ind.

Continuation-in-part of Ser. No. 129,684, Mar. 12, 1980, abandoned. This application Jul. 25, 1980, Ser. No. 172,136

Int. Cl.³ E02D *29/00*

U.S. Cl. 52—169.6 **10 Claims**



1. A moisture barrier system for earth-sheltered housing and similar earth-contacted surfaces comprising:

a plurality of single layer sheets of plastic film applied to all of the exterior surfaces of said housing that are in contact with earth, said exterior surfaces comprising a floor, ceiling and side walls, adjacent sheets of plastic film being joined to each other at overlapping joints, and

a plurality of pairs of conduit seal assemblies, at least one pair being located at each point of entry of conduits into said earth-sheltered housing, each conduit seal assembly of each pair being aligned with the other assembly of that pair each on opposite sides of said sheets of plastic film and being sealingly joined to said sheets of plastic film.

4,359,846

SEALING ARRANGEMENT FOR LOADING DOOR

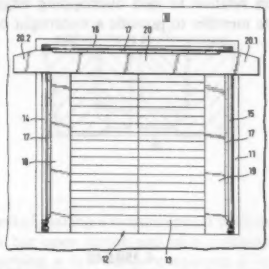
Hans Votteler, Reutlingen, Fed. Rep. of Germany, assignor to Reiff GmbH, Reutlingen, Fed. Rep. of Germany

Filed Jul. 22, 1980, Ser. No. 171,417

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930295

Int. Cl.³ E04H *14/00*

U.S. Cl. 52—173 DS **6 Claims**



1. A sealing arrangement for a loading door which has a body with an opening provided with one upper and two lateral edges and arranged to be associated with a container which has one upper and two lateral walls, the arrangement comprising sealing means having three flexible sealing elements, said sealing elements including two lateral flexible elements each extending along one of the lateral edges of the opening of the door body and an upper sealing element extending along the upper edge of the same; and means for moving said sealing elements between an inoperative position in which said sealing elements extend in a plane of the opening of the door body and an operative position in which said sealing elements are withdrawn from the plane of the opening of the door body and extend into the interior of the container so as to abut against the walls of the latter, said upper sealing element and each of said lateral sealing elements having two end portions arranged so that one end portion of said upper sealing element and one end portion of each of said lateral sealing elements overlap one another in said operative position.

4,359,847

WATERTIGHT EXPANSION JOINT

Manfred Schukolinski, Velbert, Fed. Rep. of Germany, assignor to MIGUA-Hammerschmidt GmbH & Co., Velbert, Fed. Rep. of Germany

Filed May 19, 1981, Ser. No. 265,349

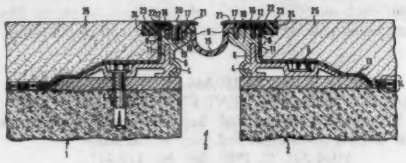
Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020035

Int. Cl.³ E04F *15/14*; E04B *1/62, 1/68*

U.S. Cl. 52—396 **5 Claims**

1. A waterproof expansion joint sealing section for the gap between adjacent floor surfaces of a structure comprising an elastic bridging member having longitudinally directed edges, an anchoring bracket having a vertical leg and a horizontal leg extending essentially parallel to the floor, means securing said

horizontal leg of each of said brackets to an associated floor surface on each side of the gap therebetween, an intermediate member secured to each of said vertical legs and rising therefrom, an elastic covering strip disposed parallel to the length of the gap, each of said longitudinal edges of the elastic bridging



member being disposed in overlapping relation to a longitudinal edge of said covering strip, a retaining strip extending over said two overlapping longitudinal edges, means co-acting with said intermediate member to maintain said retaining strip in compression relative to said overlapping edges against said intermediate member to provide a watertight connection.

4,359,848

CONCRETE SLAB ASSEMBLY, ESPECIALLY FOR BUILDING FACADES

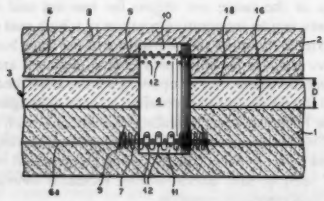
Ernst Haeussler, Grashofstr. 47, 4300 Essen 1, Fed. Rep. of Germany

Filed Oct. 31, 1980, Ser. No. 202,746

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944424; Nov. 3, 1979, 2944504

Int. Cl.³ E04B *2/28*

U.S. Cl. 52—405 **10 Claims**



1. A composite panel comprising:

a first reinforced concrete slab formed with a planar reinforcing array;

a second reinforced concrete slab coextensive with said first slab but spaced therefrom and having a respective planar reinforcing array;

at least one load-carrying tubular main anchor embedded in the concrete of each of said slabs and traversing the space between said slab; and

at least one convoluted wire reinforcing ring embedded in the concrete of one of said slabs and having a ring plane lying in the plane of said one of said slabs and spacedly surrounding said main anchor upon vibrating of said main anchor into said ring, the convolutions of said ring lying transverse to said ring plane.

4,359,849

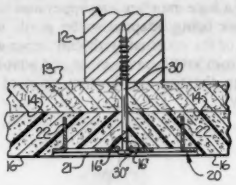
INSULATED WALL CONSTRUCTION HAVING A CLIP AND FASTENER THEREIN

Friedrich Goeman, Stone Mountain, Ga., assignor to W. R. Bonsal Company, Lilesville, N.C.

Filed Sep. 16, 1980, Ser. No. 187,739

Int. Cl.³ E04B *1/38*

U.S. Cl. 52—479 **5 Claims**



1. In an insulated wall construction, the combination of:

a substrate defining a wall surface;

at least two compressible, foamed plastic, insulation boards having a compression strength of between approximately 10 to 60 psi and being of predetermined thickness and butted together along outside edges thereof and positioned over said wall surface of said substrate with one face of said insulation board contiguous to said wall surface of said substrate;

a plurality of clips each comprising a generally flat plate of non-corrosive material positioned with one flat face thereof contiguous to the other face of said insulation boards, some of said clips spanning the butted edges of said insulation boards and other of said clips positioned between the edges of each insulation board, each of said flat plates being of predetermined dimensions for providing a bearing surface having an area of at least 1 square inch against the compressible insulation boards, at least two prongs extending generally perpendicularly outwardly from the one face of each of said plates and being of a predetermined length less than the predetermined thickness of said insulation boards and partially penetrating said insulation boards for securing said clip to said insulation boards and for connecting said insulation boards through said clips spanning the butted edges, and a centrally positioned aperture in each of said plates, and

elongate fasteners each having a head on one end thereof of approximately 5 times less surface area than said plate of said clip and of greater dimensions than said aperture in said plate, said fasteners being of a predetermined length at least ½ inch greater than the predetermined thickness of said insulation boards and each extending through respective ones said apertures and generally perpendicularly outwardly from the one face of said plate with said fastener head being retained on generally the other face of said plate, and said fasteners penetrating through said insulation boards and into said substrate for securing said insulation boards to said substrate while being restrained by said clip from undesired compression of said insulation boards.

4,359,850

BRICK CONTROL DEVICE AND METHOD

Donald W. Sinkes, R.R. 6, North Vernon, Ind. 47265

Filed May 16, 1980, Ser. No. 150,337

Int. Cl.³ E04D *15/00*

U.S. Cl. 52—747 **6 Claims**

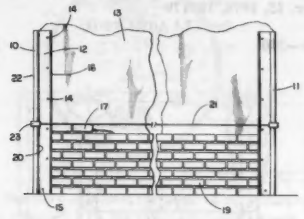
1. A brick control device for laying a brick facing adjacent a wall, which comprises:

an elongated base portion having first and second longitudinal edges;

mounting means for mounting said base portion to the wall;

a brick flange integral with and extending outwardly from

the first longitudinal edge of said base portion, said mounting means being for mounting said base portion to have said brick flange positioned to have the bricks at the outer vertical edge of the brick facing abut with said brick flange to act as an end stop for the bricks and to define the outer vertical edge of the brick facing;



a string support portion integral with and extending outwardly from the second longitudinal edge of said base portion on the same side as said brick flange;

an alignment string; and

attachment means for attaching said string to said string support portion at different locations along said string support portion.

4,359,851

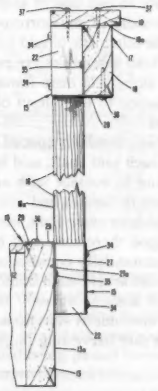
DECK APPARATUS

Phillip D. Daniels, 4797 Lake Bluff, West Bloomfield, Mich. 38033

Filed Jan. 23, 1980, Ser. No. 114,635

Int. Cl.³ F16B *7/00*

U.S. Cl. 52—298 **1 Claim**



1. In a permanent wooden deck structure having a deck perimeter-defining fascia element, a guard rail element overlying the fascia element, and vertical support post for joining said support element and said rail element, the improvements of identical upper and lower brackets, the upper bracket interconnecting said rail element and one of said posts, and the lower bracket interconnecting said fascia element and said one of said posts, each such bracket having a medial portion defining a vertical passage open at its vertical extremities and snugly receiving an end portion of the post therein, a laterally projecting vertical flange on each side of said medial portion contacting a vertical surface of the associated one of said elements, said vertical flange terminating at one edge of said passage and a horizontal pre-formed flange extension on each such flange at said one edge of said passage contacting an adjacent horizontal surface of said element, the brackets being relatively vertically reversible so that the passage edge and the flange extension of the lower bracket contact the upper surface of said fascia element and the passage edge and the flange extension of the upper bracket contact the undersurface of said rail element, and the bracket medial portions, flanges and flange extensions each being apertured for the reception of fastening means.

4,359,852

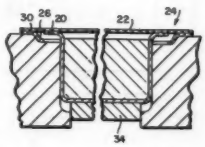
SEALED MOISTUREPROOF CONTAINER

Louis S. Hoffman, Morristown, and Susan L. Kurlander, Hoboken, both of N.J., assignors to H. P. Hood, Inc., Boston, Mass.

Filed Aug. 25, 1980, Ser. No. 181,154

Int. Cl.³ B65B *7/28, 53/06*

U.S. Cl. 53—420 **24 Claims**



1. The method of making a moistureproof package comprising forming at the open upper end of a container a flange structure comprising a first flange connected at its proximal edge to the open end of said container and a second flange connected at its proximal edge to the distal edge of the first flange, the major part of said second flange lies in a plane parallel and above the plane of the major part of the first flange, severing the first flange intermediate its proximal and distal edges to separate from the open end a surrounding hollow structure comprising the second flange and a portion of the first flange, leaving the remainder of the first flange at the open end of the container in the form of an end flange at the open end of the container, moving the container and separated surrounding structure relative to each other so that said end flange and the second flange lie in a common plane and said portion of the first flange lies below the plane of said end flange, attaching a film sheet deposited across the open end of the container to the second flange and effecting shrinkage of the film sheet in the plane of the second flange sufficiently to cause portions of the first flange connected thereto to be drawn into engagement with the underside of the end flange.

4,359,853

HARVESTING MACHINE FOR COTTON

Russell E. Simpson, Jr., P.O. Box 103, Dell, Ark. 72426

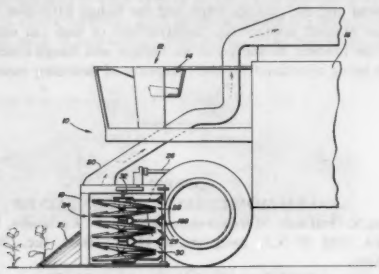
Filed Oct. 31, 1980, Ser. No. 203,388

Int. Cl.³ A01D *46/12*

U.S. Cl. 56—35 **17 Claims**

1. A harvesting machine for cotton comprising means including a pair of opposed disks capable of gripping a cotton plant therebetween and pulling the cotton off the plant, means for separating the paired disks to allow the cotton plant to enter therebetween and then close the paired disks once the cotton plant is in the picking area, said paired disks being mounted for rotation on a rotating shaft, drive means for said rotating shaft, said paired disks comprising an upper disk and a

lower disk, said means for separating and closing said disks comprising at least one cam containing a cam track and a cam



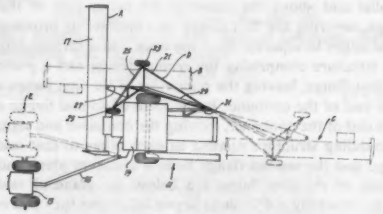
follower associated with one of said upper or lower disks and said cam track.

4,359,854

TRACTOR DRAWN HARVESTING COMBINE

Homer D. Witzel, Englewood, Fla., assignor to Chamberlain John Deere Pty. Ltd., Welshpool, Australia

Filed Jan. 14, 1981, Ser. No. 225,016
Int. Cl.[3] A01B *73/00*
U.S. Cl. 56—228 16 Claims



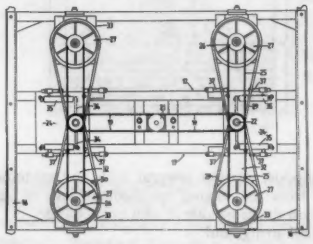
1. A harvesting combine comprising a crop gathering means supported by a first wheeled chassis and a crop treatment means supported by a second wheeled chassis, said crop treatment means having a drawbar for connection to a tractor vehicle, the crop gathering means being pivotally supported on the first wheeled chassis for rotation about a substantially vertical axis between a first position lying transversely across the first wheeled chassis and a second position lying longitudinally thereon, said first wheeled chassis being pivotally mounted to the second wheeled chassis to be movable from a first position beside the crop treatment means to a second position trailing behind the crop treatment means, wherein when the first wheeled chassis is in its first position and the crop gathering means is in its first position on the first wheeled chassis the crop gathering means extends transversely in front of the crop treatment means and the outlet of the crop gathering means is in communication with the inlet of the crop treatment means, and when the first wheeled chassis is in its second position and the crop gathering means is in its second position both the first wheeled chassis and the crop gathering means are located behind the crop treatment means.

4,359,855

HARVESTING APPARATUS

Sydney A. Goldsmith, 51 Middleton Rd., Christchurch, New Zealand

Division of Ser. No. 21,636, Mar. 19, 1979, Pat. No. 4,265,080.
This application Dec. 3, 1980, Ser. No. 212,552
Claims priority, application New Zealand, Mar. 24, 1978, 186664; Dec. 15, 1978, 189179
Int. Cl.[3] A01D *46/00*
U.S. Cl. 56—330 11 Claims



1. Harvesting apparatus, comprising:

(a) a main frame movable relative to the ground;

(b) power means mounted on said main frame to provide power for the relative movement between said main frame and the ground;

(c) at least one shaker head assembly located to each side of a longitudinal horizontal axis extending centrally through said main frame, each shaker head assembly having an output and a vertical axis of rotation, the or each shaker head assembly to one side of said longitudinal axis being located forwardly of the corresponding shaker head assembly on the other side of said longitudinal axis such that said shaker head assemblies are positioned in a staggered relationship along said main frame;

(d) a shaft attached to the output of each said shaker head assembly and

(e) at least one set of radially spaced harvesting finger means attached to each said shaft, said harvesting finger means, in use, coming in contact with and penetrating produce bearing plants or bushes and vibrating and shaking said plants or bushes to cause fruit, berries or the like produce to be dislodged therefrom, said harvesting finger means remaining substantially continuously in contact with said plants or bushes as said main frame moves through or over said plants or bushes, whereby said plants or bushes are subjected to continuous vibrations and shaking during said contact with said harvesting finger means.

4,359,856

PROCESS FOR FORMING A YARN USING A PARTIALLY ORIENTED CARRIER FILAMENT

Emilian Bobkowicz, 1435 St-Alexander St., Montreal, Quebec, Canada

Filed Oct. 4, 1979, Ser. No. 81,639
Int. Cl.[3] D02G *3/36*
U.S. Cl. 57—5 7 Claims

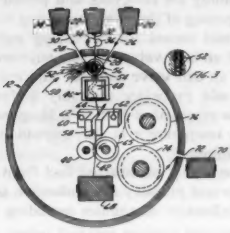
1. A process for forming a yarn comprising the steps of:

supplying at least first and second continuous filaments, the said first filament being of a partially oriented thermoplastic material;

passing at least said first continuous filament between first and second pinch-points;

subsequently subjecting said filaments and fibers to a twisting force while between said pinch-points, such that said

first filament is subjected to an intermolecular slippage and said fibers are entrapped between the filaments to



form the yarn without the need of an adhesive action to cause adherance of the fibers to the filaments.

4,359,857

DEVICE FOR COVERING STRANDING ELEMENTS

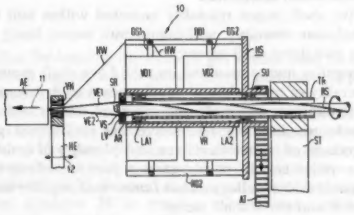
Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 28, 1981, Ser. No. 229,169

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1980, 3006055

Int. Cl.³ H01B *13/04;* D07B *3/00*

U.S. Cl. 57—18 **8 Claims**



1. In a device for covering stranded elements with a retaining spiral, said device having a stationary support tube and means for applying the retaining spiral including a rotatable spinning member arranged on said stationary support tube with the elements to be stranded being passed through the inside of said support tube, the improvements comprising a first outer tube and said spinning member being carried on said first outer tube, said first outer tube being concentrically supported for rotation on the stationary support tube, said device includes means for SZ stranding of the elements including a pipe store mounted for rotation coaxially to and inside of the stationary support tube with at least a portion of the pipe store extending into the support tube and an exit end of the pipe store being disposed adjacent a first end of the support tube, a bearing and a stranding disc being supported by said bearing in the interior of the first outer tube adjacent the first end of the support tube, said disc being removably attached to the exit end of the pipe store, said elements to be stranded being placed on the pipe store and the diameter of the support tube being selected to be large enough to provide sufficient space inside of the support tube for the elements to be stranded to move along the pipe store.

4,359,858

METHOD OF AND APPARATUS FOR WINDING A FILAMENT ONTO A BOBBIN

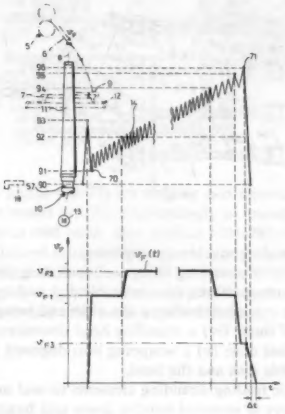
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 164,530

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1979, 2927616

Int. Cl.³ D01H *13/24, 1/20, 1/24, 1/30*

U.S. Cl. 57—93 **13 Claims**



1. In a yarn-winding method wherein

a yarn-body core is supported on an upright spindle adjacent a vertically displaceable yarn guide,

a yarn to be wound passes through said guide to said core,

said core and spindle are rotated and simultaneously said guide is displaced upwardly along said core to wind said yarn on said core at a yarn-feed rate until an instant when a yarn package having a predetermined size is formed on said core, and

thereafter said guide is lowered to a level below said core while said spindle continues to rotate to wind several turns of said yarn on said spindle below said core, the improvement comprising the steps of:

decreasing said yarn feed rate to a relatively low level prior to said instant; and

regularly decreasing said yarn-feed rate to a standstill in accordance with a predetermined program starting at said instant and ending when said several turns have been wound on said spindle.

4,359,859

TWINE FORMED OF CORN HUSKS AND LEAVES

E. Scott Bridgehouse, and William M. Hawthorne, both of Lancaster, Pa., assignors to Maize-Tech, Inc., Lancaster, Pa.

Filed Sep. 18, 1980, Ser. No. 188,186

Int. Cl.³ D02G *3/02;* D01B *1/10, 1/42*

U.S. Cl. 57—200 **2 Claims**

1. A twine adapted for use in baling and binding agricultural product comprising a twisted bundle of fibres which have been separated from a material selected from the group consisting of corn husks and leaves and mixtures thereof, which have been subjected to a caustic solution to free said fibres from the vegetable matter naturally binding said fibres.

4,359,860
MAKING ELECTRICAL CABLE

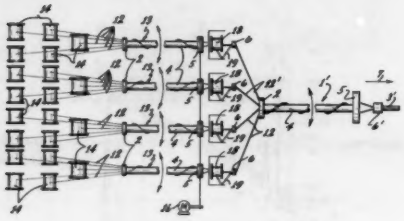
Eckard Schleese, Stadthagen; Wolf Günther, Rodenberg, and Willi Buddensiek, Nordsehl, all of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshütte AG, Hanover, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,449

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023257

Int. Cl.³ H01B *13/04*

U.S. Cl. 57—293 **3 Claims**



1. A stranding machine, comprising:

a plurality of stranding units, each including (i) a stationary disk with apertures; (ii) a rotatable disk with apertures; (iii) a tube extending between the disks and being fastened to one of them; (iv) a stranding head downstream from the rotatable disk; (v) a wrapping unit disposed between the rotatable disk and the head;

means for feeding stranding elements to said units so that a plurality of stranded bundles leave said heads;

a single drive means connected to all of said rotatable disks for reversibly driving all of the rotable disks;

a further stranding unit having a stationary disk with apertures, a rotatable disk with apertures, a tube extending between the latter disks and being fastened to one of them, a stranding head, and means connected for reversibly driving said latter rotatable disk; and

said stranded bundles being fed to said stationary disk of said further stranding unit so that a higher-order stranded bundle may be withdrawn from the head of further stranding unit.

4,359,861
GAS TURBINE

Charles Citelli, Lexington, N.Y., assignor to John Musacchia, Marathon, Fla.

Continuation-in-part of Ser. No. 870,075, Jan. 17, 1978. This application Jan. 25, 1980, Ser. No. 115,441

Int. Cl.³ F02C *3/10*

U.S. Cl. 60—39.15 **11 Claims**

1. A gas turbine comprising:

a turbine enclosure assembly;

a preheater assembly;

a plurality of combustion assemblies mounted within and supported by said turbine enclosure assembly;

compressor means mounted within said turbine enclosure assembly for supplying pressurized air to said combustion assemblies;

a pumping casing having a hollow interior and being elongated with a drive opening at one end and an exit opening at its other end and a fuel supply opening substantially midway between the drive opening and the exit opening;

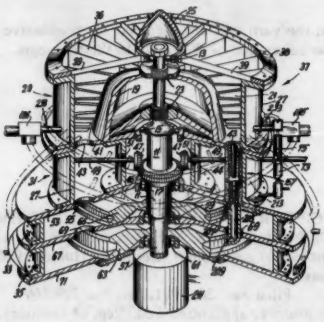
a core slidably mounted within the hollow interior of said pumping casing and having a drive end and an exit end;

a shaft connected to the drive end of said core and slidably mounted in the drive opening of said pumping casing;

means for moving said shaft back and forth to force the exit end of said core against fuel supplied through said fuel supply opening and force pressurized fuel out said exit opening of the pumping case;

means connected to both said pumping casing and said preheater assembly for coveying said pressurized fuel from said exit opening of the pumping casing to said preheater assembly, said means for conveying including a valve casing with an inlet valve and seat adjacent said pumping casing and an exit valve and seat adjacent said preheater assembly, said preheater assembly including means to preheat the pressurized fuel to a temperature below its flash point temperature at the ambient pressure of said pressurized fuel;

means for conveying pressurized fuel from said preheater assembly to said plurality of combustion assemblies, each of said combustion assemblies including means for the



further heating of said pressurized fuel to at least its flash point temperature to support combustion of the fuel in combination with the pressurized air supplied to said combustion assemblies;

a drive shaft means rotatably mounted within said turbine enclosure assembly, said compressor means being driven by said drive shaft means;

an impeller means mounted on said drive shaft means; and

a plurality of manifold and nozzle means each connected to a combustion assembly and mounted within said turbine enclosure assembly to receive the pressurized gaseous products of combustion from said plurality of combustion assemblies and direct said gaseous products of combustion against said impeller means to cause said impeller means to drive said drive shaft means.

4,359,862
METHOD FOR TREATING AN EXHAUST GAS STREAM

Kashmir S. Virk, Hopewell Junction, and Martin Alperstein, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 200,746, Oct. 27, 1980, Pat. No. 4,322,387. This application Aug. 31, 1981, Ser. No. 297,544

Int. Cl.³ F01N *3/02*

U.S. Cl. 60—274 **3 Claims**

1. Method for treating a diesel engine exhaust gas stream to remove combustible particles which are carried in the stream, which method includes the steps of;

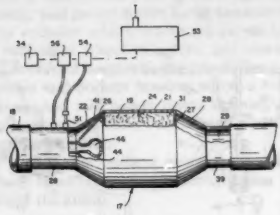
passing the particle-carrying exhaust gas stream through a filter bed which includes an oxidizing catalytic segment therein, whereby to retain said combustible particles in said filter bed,

at spaced intervals of time during operation of said engine, periodically incinerating said retained particles to purge the filter bed thereof by:

separating the exhaust gas stream into minor and major portions,

heating the minor portion to a temperature at least in excess of the oxidizing catalyst lightoff temperature,

introducing a fuel component into the heated exhaust gas portion to establish a fuel/gas mixture,



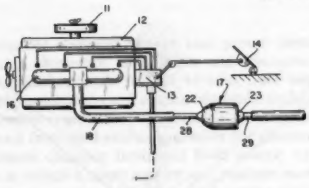
passing said heated fuel/gas mixture through said catalytic segment to combust the said mixture.

4,359,863

EXHAUST GAS TORCH APPARATUS

Kashmir S. Virk, Hopewell Junction, and Robert B. Burns, Huntington, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,608
Int. Cl.³ F01N *3/02*
U.S. Cl. 60—297 **9 Claims**



1. Filter for treating the exhaust gas stream from an internal combustion engine, which stream carries combustible particulate matter therewith, said filter including;

a casing **21** defining an elongated reaction chamber **24** which includes a filter media, and having a discharge conduit **29** and an elongated inlet port **28**, the latter being adapted to communicate with a source of said exhaust gas,

a catalyst bed **32** disposed at the upstream end of said reaction chamber **24** to receive exhaust gas which flows through said inlet port **28**,

a heater element **36** positioned in said inlet port **28** to contact at least a portion of the exhaust gas stream which flows through the latter,

injector means including a fuel line communicated with a source of fuel, and being disposed in heat exchange contact with heated portions of said filter whereby to preheat fuel which passes therethrough, and

nozzle means at the end of said fuel line which opens into said inlet port whereby to introduce a flow of heated fuel into the said at least a portion of said exhaust gas stream.

4,359,864

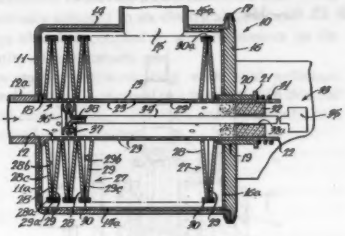
BURN-OUT TYPE CLEANING MEANS FOR PARTICULATE FILTER OF ENGINE EXHAUST SYSTEM

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00167, § 371 Date Feb. 5, 1981, § 102(e) Date Feb. 5, 1981
PCT Filed Feb. 5, 1981, Ser. No. 275,077
Int. Cl.³ B01D *39/20*; F01N *3/02*
U.S. Cl. 60—311 **9 Claims**

1. In an engine exhaust particulate filter **(10/53)** including filter means **(27/56)** for trapping particulates as exhaust gas passes from an inlet surface **(28*b*–29*b*/56*a*)** to an opposite surface **(28*c*–29*c*/56*b*)** thereof, the improvement comprising:

electrical heating element means **(32/71)** for heating the exhaust gas passing to a localized portion of said inlet surface **(28*b*–29*b*/56*a*)** of said filter means **(27/56)** to a level at which said gases ignite particulates trapped in the filter means **(27/56)**;



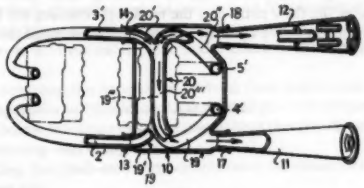
and drive means **(35/77)** for moving said electrical heating element means **(37/71)** confrontingly in immediate juxtaposition to said entire inlet surface **(28*b*–29*b*/56*a*)** so the locally heated exhaust gas progressively ignites the particulates trapped in the entire filter means **(27/56)** as said electrical hating element means **(37/71)** moves confrontingly over said inlet surface **(28*b*–29*b*/56*a*)**.

4,359,865

EXHAUST SYSTEM FOR MULTICYLINDER MOTORBIKE ENGINE

Yasuo Nakao, Iwata, and Nobuo Norimatsu, Toyooka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 28, 1980, Ser. No. 182,113
Claims priority, application Japan, Aug. 31, 1979, 54-112153
Int. Cl.³ F01N *7/08*
U.S. Cl. 60—313 **6 Claims**



1. An exhaust system for a multi-cylinder internal combustion engine for a motorbike, comprising: a plurality of exhaust pipes equal in number to the number of cylinders extending from respective ones of said cylinders; an exhaust chamber formed in a casing, said casing having an entry opening for each of said exhaust pipes, said exhaust pipes, in pairs, being convergently joined to form a gang pipe which continues the flow of each said pair of exhaust pipes and discharges into said exhaust chamber, said exhaust pipes and gang pipe having a substantial length inside said exhaust chamber; and a silencer in communication with said exhaust chamber to exhaust gases therefrom, there being a greater number of exhaust pipes than silencers.

4,359,866

ROTATABLE CONTROLLER SYSTEM

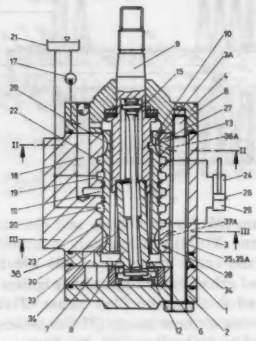
Werner Tischer, Bobingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed Apr. 2, 1980, Ser. No. 136,740

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917435

Int. Cl.³ F15B *13/04*

U.S. Cl. 60—384 **15 Claims**



14. In a fluid power steering system having a source of pressurized fluid (**17**), a servomotor (**26**), a steering drive shaft (**9**), a fluid metering device including a rotor gear (**6**), and controller means driven by the drive shaft for controlling flow of the fluid along flow paths between said source and the servomotor through the metering device and operation of the metering device including a valve housing (**3**), a tubular valve element (**10**), and means operatively connecting the drive shaft to the valve element and the rotor gear for axial and angular displacements of the valve element to respectively control said flow of the fluid and said operation of the metering device, the improvement residing in internal groove means (**31, 32, 33**) formed internally of the tubular valve element for establishing a torsional coupling between the valve element and the rotor gear and form flow passages conducting said fluid along said flow paths and distributor groove means (**29, 30**) formed externally in the valve element in angularly spaced relation to the internal groove means for establishing said flow paths, whereby the flow paths and the torsional coupling are formed in the tubular valve element having a reduced radial thickness.

4,359,867

SEAT ACCUMULATOR CLUTCH BOOSTER ASSIST

William C. Swanson, Clarendon Hills, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Mar. 3, 1981, Ser. No. 240,039

Int. Cl.³ F15B *1/02*

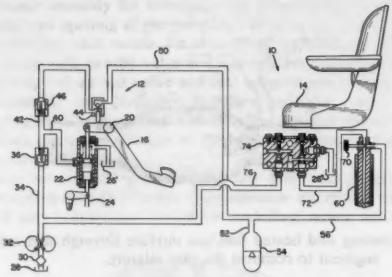
U.S. Cl. 60—413 **9 Claims**

1. In a vehicle having an operator accommodating seat and a hydraulic assisted clutch, the improvement comprising:

a hydraulic seat suspension system having an accumulator for maintaining a supply of hydraulic fluid under pressure;

a hydraulically assisted clutch booster including an operating pedal, said booster hydraulically communicating with said accumulator;

a ball check valve normally closed between said accumulator and said clutch booster, said ball check valve mechanically operable to open upon displacement of said operating pedal whereby hydraulic fluid will flow from said accumulator to said clutch booster.



4,359,868

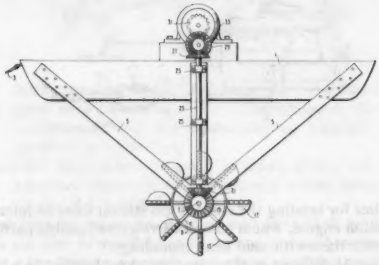
OCEAN WAVE ENERGY CONVERTER

David M. Slonim, P.O. Box 3312, West Palm Beach, Fla. 33402

Filed Jun. 10, 1981, Ser. No. 272,342

Int. Cl.³ F03B *13/12*

U.S. Cl. 60—501 **4 Claims**



1. An ocean wave energy converter, comprising a buoyant body, a framework fixedly secured to the buoyant body and extending to a depth substantially free from wave action, bucket means disposed in a series in a closed path and mounted on the lower portion of the framework for circulation in one direction, the bucket means offering greater resistance to the water upon movement through the water in one direction than in the other direction whereby the series of bucket means circulates in the same direction both when rising under the influence of wave action on the buoyant body and when falling under the influence of wave action on the buoyant body, and means to convert the kinetic energy of the circulation of the series of bucket means into another form of energy.

4,359,869

HYDRAULIC POWER BOOST APPARATUS

Yasufumi Ideta, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 29, 1980, Ser. No. 173,316

Claims priority, application Japan, Aug. 2, 1979, 54-106057[U]

Int. Cl.³ F15B *9/10, 13/10*

U.S. Cl. 60—547 B **10 Claims**

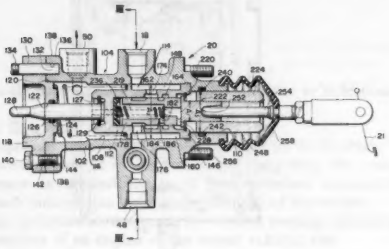
1. A hydraulic power boost apparatus in a brake system for an automotive vehicle comprising:

a booster housing communicating with a working fluid source and receiving therefrom a working fluid, which

working fluid recirculates through a hydraulic circuit via said booster housing;

a power piston slidably disposed within the interior of said booster housing and movable along the longitudinal axis of said housing, said power piston being connected with a brake master cylinder which distributes pressurized fluid to each of individual wheel cylinders, said power piston cooperating with said booster housing to define a pressure chamber within said booster housing where a boost pressure is built up, and said power piston defining therein a longitudinally extending blind bore having a bottom adjacent said master cylinder;

an elastically deformable resilient member disposed at the bottom of said blind bore, said resilient member having a predetermined thickness;



a valve member disposed within said power piston and cooperating therewith to connect and disconnect said pressure chamber with respect to said fluid source in response to application and release of a brake pedal, which valve member is movable from an initial position in which it is spaced from said resilient member for disconnecting said pressure chamber from said fluid source, to a first position in which it abuts against said resilient member to push said power piston towards said master cylinder to connect said pressure chamber to said fluid source, and to a second position in which it deforms said resilient member to transmit a braking force applied to said brake pedal directly to said power piston; and

a stroke limiting means for limiting the movement of said valve means beyond said second position, thereby preventing said resilient member from being deformed beyond its elastic limit.

4,359,870

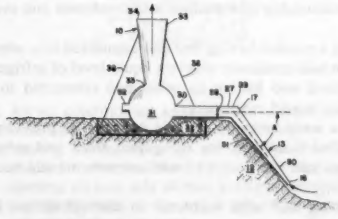
APPARATUS FOR PRODUCING ELECTRICITY FROM SOLAR ENERGY

Aldon E. Holton, Sr., Rte. 2, Box 140, Floral City, Fla. 32636

Filed Feb. 24, 1982, Ser. No. 351,899

Int. Cl.³ F03G *7/02*

U.S. Cl. 60—641.12 **6 Claims**



1. An apparatus for producing electrical energy from sunlight comprising:

(a) an upwardly convergent air housing having a floor and a roof comprised of interengaged flat panels capable of transmitting sunlight, said housing positioned on a hillside exposed to sunlight and causing air therein to be heated and directed upwardly to an apex opening,

(b) at least one elongated tunnel positioned above said air housing and having opposed entrance and exit extremities, said entrance extremity being coupled in airtight manner to said apex opening,

(c) a bladed structure rotatively mounted within said tunnel and mechanically coupled to an electrical generator,

(d) a collector chamber coupled in airtight manner to the exit extremity of said tunnel, and

(e) a chimney stack communicating with said collector chamber and vertically oriented in a manner such that the longitudinal center axes of said stack and tunnel intersect at a substantially right angle.

4,359,871

METHOD OF AND APPARATUS FOR THE COOLING OF NATURAL GAS

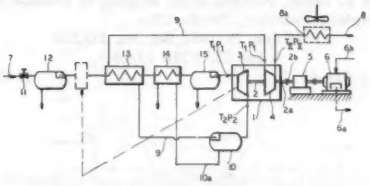
Wilfried Strass, Neukirchen-Vluyn, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 98,792

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1978, 2852078

Int. Cl.³ F17D *1/04;* **F01K** *25/10*

U.S. Cl. 60—648 **9 Claims**



1. A method of cooling natural gas derived from a source at an elevated pressure and supplying a consumer with a compressed portion of the natural gas, said method comprising the steps of:

work expanding the natural gas derived from said source in an expansion turbine to cool the natural gas to a temperature below the dew point of a component thereof, thereby condensing said component;

separating the condensed components from the remainder of the natural gas;

compressing said remainder of the natural gas in a compressor coupled to said turbine and forming a set therewith, the compressed remainder of the natural gas being delivered to said consumer; and

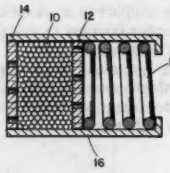
controlling the expansion and compression of the gas in response to variable pressure differences between an input to said expansion turbine and an output of said compressor by withdrawing energy beyond that required for said compressor, supplying energy to said set upon the source pressure diminishing to a level precluding condensation of said component and carrying out the compression of said remainder of said natural gas selectively directly at the expansion temperature or after heat exchange with the gas to be fed to said input.

4,359,872

LOW TEMPERATURE REGENERATORS FOR CRYOGENIC COOLERS

Michael P. Goldowsky, Valhalla, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Sep. 15, 1981, Ser. No. 302,279
Int. Cl.[3] F25B *9/02*
U.S. Cl. 62—6 2 Claims



1. A regenerator, for a closed thermodynamic cycle cooler, comprising:

a cylindrical container having two open ends;

a first porous plate closing one end of the container;

a second porous plate, slidably mounted in the cylindrical container, closing the second end of the container;

a plurality of hollow glass spheres containing helium in the container between the porous plates; and

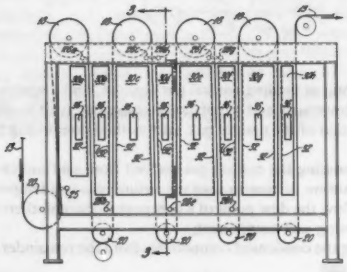
means for compressing the glass spheres between the two porous plates.

4,359,873

COOLING ASPHALTIC STRIP MATERIAL

Donald R. Miller, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 29, 1981, Ser. No. 278,534
Int. Cl.[3] F25D *13/06*
U.S. Cl. 62—63 13 Claims



1. Apparatus for cooling a continuously moving strip of asphaltic material comprising means for directing said asphaltic material into a plurality of loops having lengths and widths, and a plurality of cooling units, each of said cooling units being associated with one of said loops, each cooling unit comprising:

a. spraying means positioned to spray evaporative liquid onto the asphaltic material in the loop; and

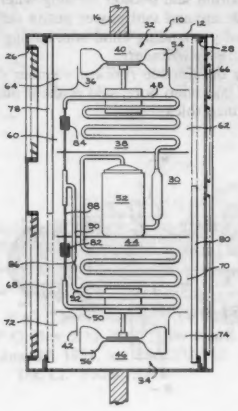
b. air delivery means positioned immediately downstream from said spraying means and adapted to cause an array of air jets to impinge on the asphaltic material substantially normally thereto to evaporate said evaporative liquid from the asphaltic material in the loop.

4,359,874

REFRIGERATION SYSTEM MODULATING MEANS

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 13, 1981, Ser. No. 243,410
Int. Cl.[3] F25B *5/00, 41/06*
U.S. Cl. 62—117 4 Claims



1. A refrigeration system operable in a heating and cooling mode including an evaporator, a compressor, a condenser, and restriction means for metering liquid refrigerant flow from said condenser to said evaporator said restriction means comprising:

a first and second capillary tube means in series flow relationship intermediate said condenser and evaporator;

a conduit connected at one end at the entrance to said second capillary and at its other end to a selected point in said condenser for directing a portion of refrigerant at said point to the entrance of said second capillary, said selected point in said condenser being in a position between its inlet and outlet where a liquid level of refrigerant is required;

a sonic resistor in said conduit for providing a controlled flow path for refrigerant from said selected point on said condenser to said entrance to said second capillary, said sonic restrictor being dimensioned so that gaseous refrigerant when present in said sonic restrictor will cause a reduction in refrigerant flow to said second capillary relative to when liquid refrigerant is flowing through said sonic restrictor.

4. The method of modulating refrigerant flow between the system condenser and evaporator including the steps;

providing a first and second capillary tube means in series flow relationship intermediate said condenser and evaporator;

providing a conduit having one end connected to a selected point in said condenser where a liquid level of refrigerant is required and having its other end connected to the entrance to said evaporator;

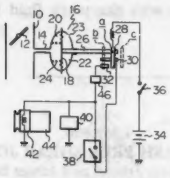
locating a sonic restrictor in said conduit for providing a controlled flow path for refrigerant from said selected point on said condenser to said entrance to said second capillary;

dimensioning said sonic restrictor so that refrigerant flow between the condenser and evaporator is modulated in accordance to the state of refrigerant flowing therethrough so that refrigerant in liquid state is present at said selected point.

4,359,875
AUTOMOTIVE AIR CONDITIONING APPARATUS

Masami Ohtani, Konan, Japan, assignor to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,228
Claims priority, application Japan, Apr. 22, 1980, 55-53987
Int. Cl.[3] B60H *3/04*; F25B *27/00*
U.S. Cl. 62—133 10 Claims

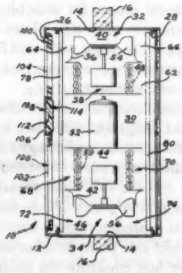


1. An air conditioning apparatus for a motor vehicle comprising:
an air flow duct;
a compressor for driving a cooler to cool air in the duct;
compressor control means for on-off controlling the compressor in dependence on a predetermined parameter which indicates an operating condition of the cooler;
engine operation sensor means for sensing varying operating condition of an engine of the motor vehicle; and
control interruption means for preventing the compressor control means from controlling the compressor under at least one predetermined engine operating condition of the motor vehicle;
said compressor control means comprising a switch means which is caused by the control interruption means to be bypassed by an electric power supply path to the compressor.

4,359,876
ROOM AIR CONDITIONER SENSOR APPLICATION

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 17, 1981, Ser. No. 235,264
Int. Cl.[3] F25D *17/00*
U.S. Cl. 62—180 5 Claims

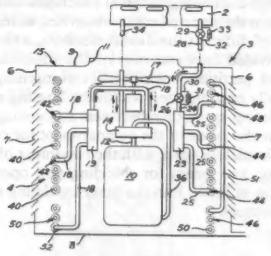


1. An air conditioning apparatus for conditioning air in an enclosure having a wall opening comprising:
a housing having openings on opposite sides thereof and adapted to be positioned in said wall opening with the opening on one side of said housing facing the outdoors and the opening on the other side of said housing facing indoors of the enclosure:
a central chamber defined by spaced partition means dividing said housing into an evaporator compartment and a condenser compartment;
a refrigerating system including a condenser in said condenser compartment, an evaporator in said evaporator compartment and a compressor in said central chamber;
each of said compartments having an inlet and an outlet communicating with said indoor facing opening of said housing;
air moving means in each of said compartments for recirculating enclosure air through each of said compartments;
a front panel including louvered portions arranged over the inlet and outlets of each of said compartments and having a heat exchange baffle positioned between said louvered portions and exposed to the enclosure ambient temperature;
a sensor mounted in juxtaposition to said heat exchange baffle and insulation thermally isolating said baffle and sensor from the interior of said housing so that, when said compressor and air moving means are de-energized, residual air from within said housing will flow by natural convention over said heat exchange baffle to affect the temperature sensed by said sensor to prevent premature re-energization of said compressor and said air moving means.

4,359,877
HEAT PUMP COIL CIRCUIT

Gerard G. Coyne, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed May 11, 1981, Ser. No. 262,250
Int. Cl.[3] F25B *47/00*
U.S. Cl. 62—278 5 Claims



1. An outdoor heat exchanger coil for use in a reverse cycle refrigeration system including a motor compressor, an indoor heat exchanger, a valve for reversing the flow of refrigerant through said system to operate said system in a cooling defrost mode or a heating mode with each of said heat exchangers arranged interchangeably as a condenser or as an evaporator said outdoor heat exchanger comprising:
A central portion including a plurality of substantially vertically disposed central circuits of spine fin heat exchange tubing, each of said circuits defining a single continuous passageway between a first opening connected to said reversing valve and a second opening connected to the system liquid line;
a split circuit including a lower circuit arranged below said vertically disposed central circuits and an upper circuit arranged above said vertically disposed central circuits, means interconnecting said lower and upper circuit in series refrigerant flow to define a single continuous passageway between a first opening in said lower section and a second opening in the upper circuit of said split circuit;
conduit means including a first refrigerant line connecting said first opening in said lower circuit of said split circuit to the system reversing valve and a second refrigerant line connecting said second opening to the system liquid line whereby a portion of relatively warm gaseous refrigerant is fed from said compressor through said reversing valve directly to said lower circuit of said split circuit through

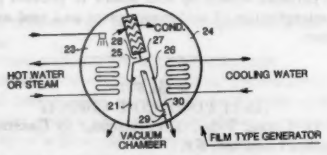
said first opening when the system is in the defrost mode, and for directing a portion of liquid refrigerant from said system liquid line directly to said upper circuit of said split circuit through said second opening when the system is in the heating mode.

4,359,878

INSULATING MEANS FOR USE IN ABSORPTION REFRIGERATORS

Isaih Vardi, Rehovoth; Joseph Bourne, Raanana; Jonathan Ben-Dror, Hadar Am, and Yigal Kimchi, Ramat Gan, all of Israel, assignors to Eshel Residual Energy for Cooling and Heating Ltd., Yavne, Israel

Filed Mar. 23, 1981, Ser. No. 246,843
Claims priority, application Israel, Mar. 25, 1980, 59706
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—476 **5 Claims**



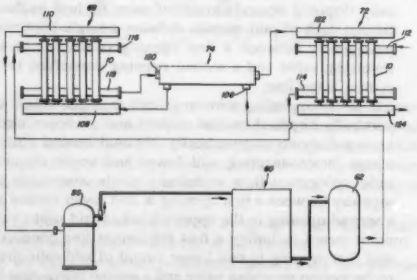
1. An absorption type refrigeration device of the type using a lithium halide (bromide and/or chloride)/water cycle and having housings containing different functional elements of the device, wherein the improvement comprises, at least in one of the housings of different functional elements, a partition compartment provided between two of the different functional elements, said partition compartment comprising two wall members totally encompassed within the housing and defining an inner insulating space therebetween, an opening being provided towards the inside of the compartment for communicating the inner insulating space with the remainder of the interior of the housing; and means for shielding said opening against the penetration of liquid into the inner insulating space of the partition equipment.

4,359,879

REFRIGERATION SYSTEM AND NOVEL HEAT EXCHANGER THEREFOR

Neal A. Wright, Columbus, Ga., assignor to Diversified Air Products, Inc., Columbus, Ga.

Filed Dec. 31, 1980, Ser. No. 221,912
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—513 **9 Claims**



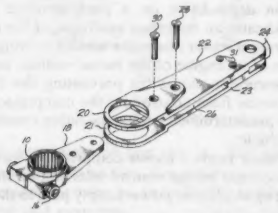
1. A refrigeration system utilizing a two phase refrigerant comprising a refrigerant compressor for compressing refrigerant vapor, a refrigerant condenser in communication with the compressor for condensing the refrigerant into liquid, an evaporator in communication with the condenser through an expansion means and having a discharge in communication with the compressor, said evaporator including a work fluid flow path and a separate refrigerant flow path, and cooling heat exchanger means for cooling said liquid refrigerant from said condenser prior to the refrigerant entering the refrigerant flow path in the evaporator; said cooling heat exchanger means including a refrigerant flow path and a separate coolant fluid flow path; the coolant fluid flow path in the condenser being in flow communication with the work fluid flow path in the evaporator.

4,359,880

BACKLASH FREE SHEAR JOINT

Joseph B. Berlin, Mercer Island, and James B. Skilton, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 3, 1980, Ser. No. 165,897
Int. Cl.³ F16D *3/56*
U.S. Cl. 464—33 **1 Claim**



1. A backlash free shear joint comprising:

a flanged hub member having a hub portion adapted to be secured to a shaft and a flange extending from said hub in a direction substantially normal to the longitudinal axis of said hub portion, said flange being provided with at least two colinear radially disposed holes, from the hub;

a pair of side plate members, each member having at one end a portion dimensioned to encircle said hub portion with a predetermined clearance thereabout and having at its other end attachment means for attaching said side plate to utilization structure, said side plates being provided with holes configured to align with said flange holes, said holes being colinear and at predetermined radii r_A, r_B from said attachment means, where $r_B > r_A$;

at least two shear pins, each shear pin being located in the aligned pair of said flange and side plate holes for preventing relative motion between said flanged hub and said side plate members until a predetermined differential force between the hub and the side plate shears said pins;

said clearance of said side plates about said hub being selected such that at a predetermined loading between said flanged hub and said side plate member said first shear pin shears prior to the hub engaging the encircling portion of the side plates, and thereafter said side plate members rotate about said second shear pin until the side plate encircling portions engage the hub with said second pin shearing if said loading exceeds a second predetermined value; and

wherein said side plate members are formed of a selected material in a predetermined shape such that they are capable of flexing in a direction parallel to the longitudinal axis of said shear pins whereby galling, reseizing or high friction caused by the sheared edges of a sheared pin is eliminated.

4,359,881

DRAWING DEVICE FOR A STRAIGHT KNITTING MACHINE

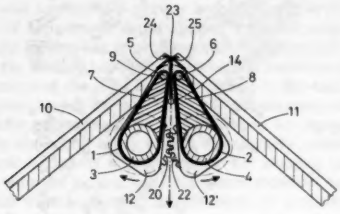
Marcello Baseggio, Ollon, and Louis Frund, Monthey, both of Switzerland, assignors to Atelier de Construction Steiger S.A., Switzerland

Filed Jul. 22, 1980, Ser. No. 171,082

Claims priority, application Switzerland, Sep. 25, 1979, 8629/79

Int. Cl.[3] D04B *15/88*

U.S. Cl. 66—149 R 5 Claims



1. A drawing device for a straight knitting machine with a plurality of needle rows on which a knitted fabric is formed comprising:

a fixed support means;

two belt assemblies disposed on said support means with knitted fabric being disposed between said assemblies, each assembly comprising:

a shaft, coupled to driving means;

a frame movably disposed in said shaft;

a small pulley movably disposed on said frame in close proximity to said needle rows; and

a belt disposed around said shaft, frame and pulley, said belt being driven by said shaft;

said belts being driven in opposite direction and adapted to draw said knitted fabric wherein said pulleys are provided solely to assure pressure on said fabric.

4,359,882

PORTABLE, SELF-STORING CONSOLE PROTECTION STRUCTURE

Gary S. Peifer, Waynesville, and Virgil H. Johnson, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 31, 1980, Ser. No. 261,106

Int. Cl.[3] B65D *55/14;* B60K *37/00*

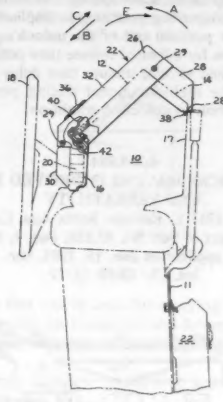
U.S. Cl. 70—168 8 Claims

1. A self-storing, portable instrument console protection structure (22,22') for shielding faces (12,14,16) of a console (10,10'), said protection structure (22,22') comprising:

a central shielding portion (26) having first end and a second end, said central shielding portion (26) being disposable in a closely spaced obstructing position relative to a central console face (12) and being removable from the console (10,10') to any desired location;

a first extensible shielding portion (28) being pivotally connected (29) to said central shielding portion's (26) first end to swing between a closely spaced obstructing position relative to a first console face (14) and a retracted position in which said first extensible shielding portion (28) is housed in said central shielding portion (26); and

means (32) for selectively interconnecting said shielding portions (26,28) with said console (10,10') when said central (26) and first extensible shielding (28) portions occupy said obstructing positions.



4,359,883

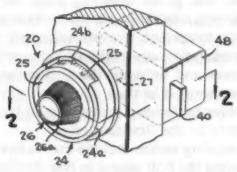
TIME DELAY COMBINATION LOCK

Charles G. Bechtiger, La Chaux-de-Fonds, Switzerland, and James C. Miller, Nicholasville, Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Nov. 24, 1980, Ser. No. 209,480

Int. Cl.[3] E05B *43/00*

U.S. Cl. 70—269 22 Claims



1. In a time delay combination lock including a lock case, a combination mechanism including a plurality of peripherally gated tumbler wheels rotatably journaled about a common axis, a driving cam on a drive spindle extending along said axis from a dial to adjust the angular positions of the tumbler wheels through lost motion couplings, and a fence lever pivoted on a reciprocative bolt to descend from a raised position to a lower coupled position with the drive cam and movable thereby along an unlocking path at the lower coupled position to retract the bolt; a timer mechanism in the lock case having a clockwork mechanism including a main spring and a main shaft, an intercoupling gear train for transmitting drive to and from the main shaft including an input gear adjacent said driving cam, means on said driving cam for activating the input gear to wind the main spring to wound-up condition upon rotation of the dial and driving cam through a predetermined arc, a pivoted blocking lever biased to a normal blocking position disposing an abutment shoulder adjacent and in the unlocking path of a portion of the fence lever to bar unlocking movement of the fence lever in its lower coupled position, said lock case having a fixed backup shoulder immediately adjacent said blocking lever in a direction to engage and support the blocking lever against attempted forced displacement of the fence lever and bolt in a bolt unlocking direction, the intercou-

pling gear train including means for permitting multidirectional operation of the dial to dial the unlocking combination for a limited-time dialing period during a first time interval following wind-up of the main spring, and lever means coactive with said intercoupling gear train to displace said blocking lever to a release position out of the unlocking path of said fence lever portion for a limited release time period commencing a predetermined several minute time delay interval after termination of the multidirectional dialing period to allow retraction of the bolt to unlocked condition.

4,359,884

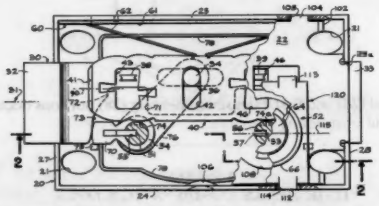
DUAL KEY LOCKS HAVING IMPROVED PRECISION AND VERSATILITY

James M. Miles, 1511 E. Edinger, Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 45,124, Jun. 4, 1979, Pat. No. 4,332,153. This application Jan. 15, 1981, Ser. No. 225,304

Int. Cl.³ E05B *35/12*

U.S. Cl. 70—339 **26 Claims**



1. A lock which includes a housing having two end walls, bolt means, means for moving the bolt means along a bolt axis between locking and releasing positions, fence means coupled to the bolt means, at least one set of flat tumblers mounted in the housing for independent movement transversely of the bolt axis, at least one gated blocking edge on each tumbler for cooperation with the fence means to normally block the bolt means from movement toward releasing position, and key receiving means for controlling said tumbler movement to align the gates and unblock the bolt means; said lock being further characterized in that:

each tumbler includes a second gated blocking edge facing oppositely to the first said edge,

said bolt moving means include means operable alternatively for moving the bolt means in one direction for bolt projection at one housing end wall for right-hand installation, and for moving the bolt means in the other direction for bolt projection at the other end wall for left-hand installation,

said fence means cooperating with one set of blocking edges for controlling bolt operation in one direction and cooperating with the other set of blocking edges for controlling bolt operation in the other direction.

4,359,885

KEY-OPERATED LOCKS

Ilan Goldman, 10 Bar-Eli St., Tel-Aviv, Israel

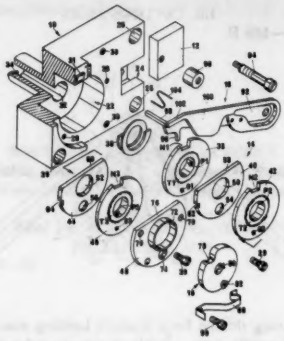
Filed Dec. 21, 1979, Ser. No. 105,904

Claims priority, application Israel, Dec. 28, 1978, 56335

Int. Cl.³ E05B *21/00, 25/00*

U.S. Cl. 70—355 **22 Claims**

1. A key-operated lock for safe doors and the like comprising a housing; a lock-bolt operable between an unlocked, withdrawn position and a locked, projected position; a lever coupled at one end thereof to the lock-bolt and provided at its other end with an extended control member and with engaging means; a rotatable lever-operating member; a plurality of indexable tumblers mounted in axial alignment with respect to each other, the tumblers being indexable by a key to assume a pre-determined relative position with respect to each other and to said control member; said tumblers comprise an axial central portion defining an opening for receiving a shank of said key, and a peripheral portion having a recessed circumference for receiving said lever control member in said pre-determined relative position of the tumblers; said central and said peripheral portions of each said tumbler are disengageable from each other for adjusting their relative angular positions; each of said central portions of said tumblers is provided with a tumbler



projection extending into said opening; said tumblers are rotatably supported by flanged projections of a plurality of fixed plates interposed between adjacent tumblers; said lever being displaceable between operative and non-operative positions controlled by said control member and said tumblers, the arrangement being such that in said operative position, the said tumblers are in said pre-determined relative position and said engaging means are coupled to said lever operating member.

4,359,886

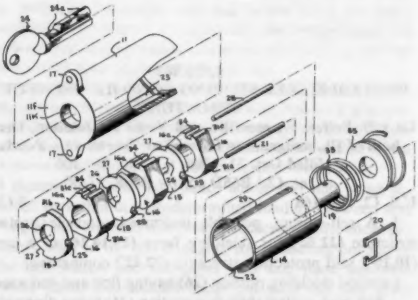
KEY LOCK CYLINDER FOR POSSIBLY CONTAMINATED ENVIRONMENTS

Walter R. Evans, Lancaster; Gary R. Murphree, Lexington, and Shelly M. Osborne, Nicholasville, all of Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Feb. 25, 1981, Ser. No. 237,983

Int. Cl.³ E05B *29/08*

U.S. Cl. 70—366 **27 Claims**



1. A cylinder lock of the rotatable disc tumbler type provided with contaminant accommodating spaces to minimize foreign matter contaminant jamming of relatively movable lock components for use in contaminated environment installations and the like, comprising a stationary lock casing member having a cylindrical cavity therein for accommodating a rotatable core assembly, a rotatable cylinder lock core assembly in said cavity including a tubular cylindrical shell member rotat-

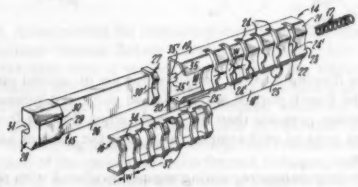
able in the cavity and having a hollow bore closed by a rear wall, a plurality of rotary locking disc tumblers with a spacer member interposed between each pair of disc tumblers forming a stacked array of tumblers and spacers encircled within said shell member and rotatable about a common axis therein, an elongated locking bar partially lying in a slot in said shell member arranged parallel to the axis of rotation of said disc tumblers adjacent the periphery thereof normally restrained by the disc tumblers in a position traversing the shear line between the shell member and the casing for locking the shell member against rotation relative to the casing, the disc tumblers being formed with substantially circular body portions having gate recesses of appropriate depth aligned with and adapted to receive the locking bar to accommodate radial inward movement of the locking bar relative to the disc tumblers to positions rotation of the shell member relative to the casing and said tumblers having key openings therein collectively defining a forwardly opening keyway and shaped to be engaged and angularly moved by a key having substantially semicircular cross-section portions inserted therein for aligning the gate recesses with the locking bar, said spacer members having a cylindrical center opening therethrough of predetermined larger radius than the radius of the substantially semicircular key portions providing space therebetween for accommodation of foreign matter contaminants and the spacer members having a substantially circumferentially spaced outer peripheral formation to bear against the walls of said hollow bore and having periphery portions therebetween spaced from the walls of said hollow bore providing foreign matter contaminant accommodating spaces.

4,359,887

KEY PLATE AND HOOK ASSEMBLY

Aron Beilis, 116 Bowdoin St., Staten Island, N.Y. 10306

Filed Dec. 17, 1980, Ser. No. 217,208
Int. Cl.³ A47G *29/10*
U.S. Cl. 70—456 B **8 Claims**



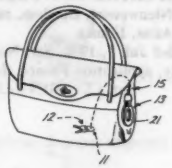
1. A key plate and hook assembly comprising an elongated tubular housing having front, rear, upper and lower walls and a plurality of transverse slots in said front wall and extending partially into said upper and lower walls with each slot having a recess in one edge thereof, a body member having a rear wall, end portions of a cross sectional configuration corresponding to the internal cross sectional configuration of said tubular housing and an intervening connecting portion, a U-shaped locking member carried by said connecting portion and forming with said connecting portion a cross sectional configuration corresponding to the configuration of said end portions, said U-shaped locking member having a plurality of transverse slots having spacings corresponding to the spacings of the first said slots, the last said slots being separated by intervening ribs and means slidably retaining said body and U-shaped member within said body whereby key hooks each having an enlarged end portion are normally held in engagement with the slots in said key plate when said locking member is in one position with said ribs underlying said recesses and are removably when said locking member is moved to another position to displace said ribs and open said recesses and permit disengagement of said key hooks.

4,359,888

DEVICE AND METHOD FOR STORING KEYS

Betty J. Scheineman, 7111 Richwood, Houston, Tex. 77087

Filed Mar. 21, 1980, Ser. No. 132,621
Int. Cl.³ A47G *29/10*
U.S. Cl. 70—457 **11 Claims**



1. A device that can be used for carrying keys in the compartment of a purse, such compartment having a bottom at one end, surrounding sides and an opening at the other end, comprising:

a key retaining device to which such keys can be attached;

an end piece; and

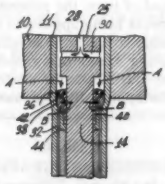
a long, flexible member connected at one end to said key retaining device and at the other end to said end piece, the length and flexibility of said member being such that when said key retaining device carrying such keys rests on the bottom of such compartment, a portion of said member including said other end of said member can extend over the sides of and outside such compartment through the opening therein with said end piece hanging freely outside such compartment, and the combined weight of such end piece and such portion of said member being less than that required to cause said key retaining device to be forced by gravity off of such bottom of such compartment.

4,359,889

SELF-CENTERING SEAL FOR USE IN HYDRAULICALLY EXPANDING TUBES

John W. Kelly, Burbank, Calif., assignor to Haskel Engineering & Supply Company, Burbank, Calif.

Filed Mar. 24, 1980, Ser. No. 133,010
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—62 **11 Claims**



1. A swaging apparatus for expanding a tube radially comprising:

a mandrel body for axial insertion in said tube to introduce a pressurized working fluid into said tube to cause the radial expansion of said tube;

a deformable sealing member encircling said mandrel body to be compressed axially and expanded radially upon the application of pressure thereto by said working fluid; and

centering means for preventing angular movement of said sealing member relative to the longitudinal axis of said tube as said tube expands radially, thereby forcing said sealing member to assume a radially centered position within said tube to define a substantially uniform circumferential extrusion gap adjacent said sealing member;

said centering means comprising a sleeve that is axially slidable on said mandrel body, said sleeve having a flange

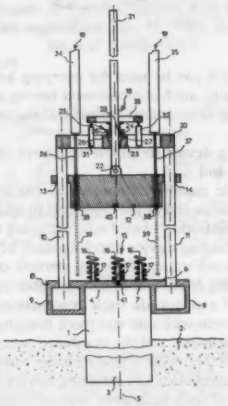
that extends radially outwardly and said sealing member being confined axially between said flange and a portion of said mandrel.

4,359,890

APPARATUS FOR TESTING THE LOAD-BEARING PROPERTIES OF A FOUNDATION

Gaspar Coelus, Nieuwpoort, Belgium, assignor to Societe Anonyme France-Atlas, France

Filed Jul. 7, 1980, Ser. No. 166,297
Claims priority, application France, Jul. 9, 1979, 79 18176
Int. Cl.³ G01N *3/34*
U.S. Cl. 73—12 **13 Claims**



1. Apparatus for testing the load-bearing properties of a foundation such as a pile, comprising a weight, means for sustaining said weight in a position at an initial height above the foundation, means for releasing said weight to fall by gravity toward the foundation, means for guiding said weight, resilient means interposed between said weight and said foundation, said resilient means being compressed by the kinetic energy of the falling weight and converting such kinetic energy into potential energy while applying a force to said foundation over a period of time, the potential energy of the compressed resilient means being applied to said weight to project said weight upwardly to a second height lower than its initial height, said sustaining means being operative to sustain it at said second height and means for sensing movement of said foundation by force applied through said resilient means.

4,359,891

REPETITIVE CHROMATOGRAPHIC APPARATUS

Ross C. Ahlstrom, Jr.; Mark S. Johnson, both of Lake Jackson; Jerry P. Moore, Katy, and Ivo R. Schoppe, Jr., Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1981, Ser. No. 222,419
Int. Cl.³ G01N *31/08*; B01D *15/08*
U.S. Cl. 73—23.1 **4 Claims**

1. A gas chromatographic apparatus which is capable of rapid, repetitive, on-stream process analysis comprising:

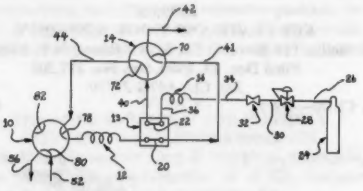
(1) a single chromatographic column having a sample inlet and a sample outlet and containing a suitable column packing material;

(2) a detector in direct fluid communication with the chromatographic column at the column's outlet by having the detector's sample inlet closely abutting the column's outlet;

(3) a backflush valve which is capable of being switched to different flow positions and having at least four ports and at least two channels which are moveable with respect to these ports in a manner such that each channel is capable of forming a fluid communication link between separate pairs of the ports of the backflush valve; this backflush valve being in fluid communication via its first port with the detector through the detector's sample outlet, this backflush valve being in fluid communication via its second port with a vent, and this backflush valve being in fluid communication via its third port with a carrier gas supply source;

(4) a sample valve which is capable of being switched to different flow positions independently of the switching of the backflush valve; said sample valve having at least four ports and at least a first, second, and third channel, the channels being moveable with respect to the sample valve's ports in a manner such that each channel is capable of forming a fluid communication link between a pair of the sample valve's four ports according to the position to which the sample valve is switched; said sample valve being in direct fluid communication via its first port with the inlet of the chromatographic column by having said inlet at least closely abutting the first port of the sample valve; said sample valve being in fluid communication via its second port with the backflush valve through the fourth port of the backflush valve; said sample valve capable of being in fluid communication via its third port with a process stream to be analyzed, and said sample valve being in fluid communication via its fourth port with an exit for the sample;

(5) a pressure regulating means capable of maintaining carrier gas flowing into the sample valve via its second port from the fourth port of said backflush valve at a substantially lower pressure than the sample when flowing from the first port of said sample valve into the inlet of said column;



(6) a first temperature regulating means associated with the sample valve for controlling the temperature of any sample flowing through the sample valve from a process stream to be analyzed;

(7) a second temperature regulating means for controlling the temperature of the carrier gas, the chromatographic column, the detector and the reference cell at a predetermined, constant temperature;

said pressure regulating means being coordinated with the first and second temperature regulating means so that liquid sample flowing in the sample valve from its third port to its fourth port through its second channel will remain liquid therein but will have sufficient energy so that it will immediately volatilize upon said sample valve's being switching to its second position wherein the sample trapped in the sample valve's second channel is suddenly injected into the carrier gas between the sample valve's first and second ports; and

(8) a valve switching means capable of independently switching the backflush and sample valves to their different flow positions;

said first flow position of the backflush valve being one in which one of its channels forms a fluid communication link between its first port and its second port while an-

other of its flow channels forms a fluid communication link between its third and fourth ports;

said second flow position of the backflush valve being one in which one of its flow channels forms a fluid communication link between its first and third ports while another of its channels forms a fluid communication link between its second and fourth ports; and

said first flow position of the sample valve being one in which the first of its channels forms a fluid communication link between its first and second ports while its second channel forms a fluid communication link between its third and fourth ports; and

said second flow position of the sample valve being one in which its second channel forms a fluid communication link between its first and second ports while its third channel permits a liquid communication link between its third and fourth ports.

4,359,892
ARRANGEMENT FOR MEASURING SURFACE PROFILES

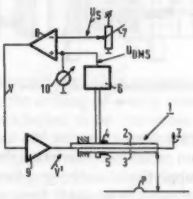
Axel Schnell, Aachen, and Heinrich Oepen, Stolberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,468

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950627

Int. Cl.³ G01B *5/28*

U.S. Cl. 73—105 **9 Claims**



1. An apparatus for measuring surface profiles comprising, a bilaminar ceramic flexure element supporting a test probe that is movable over a surface to be tested, the flexure element including means for generating a voltage which is proportional to the deflection of the flexure element, means for comparing the generated voltage with a source of reference voltage and for amplifying a difference voltage that results from the comparison of the generated and reference voltages, and means for applying the amplified difference voltage to the flexure element such that the applied force of the test probe on the tested surface is independent of the deflection of the flexure element.

4,359,893
VOLTAGE SOURCE FOR ION CURRENT MEASUREMENT IN AN INTERNAL COMBUSTION ENGINE

Alfred Kizler, Stuttgart, and Günter Schirmer, Ingersheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

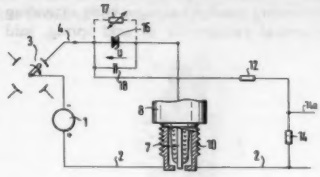
Filed Feb. 17, 1981, Ser. No. 234,930

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006665

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—115 **18 Claims**

1. A voltage supply circuit for measurement of pressure fluctuations in a combustion chamber of an internal combustion engine by reference to ion current, in the gas in said chamber comprising a constant voltage electrical element interposed in the connection line between the source of ignition high voltage and a spark plug, and a capacitor connected thereto so as to be charged to not more than said constant voltage, and means for applying the voltage charge of said capacitor to a circuit including a measuring resistor and an



electrode in said combustion chamber disposed for detection of ion current.

4,359,894
THROTTLE VALVE MOST CLOSED POSITION SENSING SYSTEM

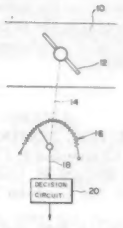
Kenji Ikeura, and Kunifumi Sawamoto, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 30, 1981, Ser. No. 230,288

Claims priority, application Japan, Jan. 31, 1980, 55-10501

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **6 Claims**



1. A throttle-valve most closed position sensing system for use with an internal combustion engine having an induction passage provided thereinwith a throttle valve, said system comprising:

(a) a throttle position sensor for providing a signal proportional to the degree of opening of said throttle valve; and

(b) a decision circuit for deciding throttle-valve position as the most closed position when receiving, from said throttle position sensor, a signal smaller than or equal to the smallest signal having received therefrom.

4,359,895
NEEDLE POSITION INDICATOR FOR A FUEL INJECTOR NOZZLE HOLDER

George D. Wolff, and Michael S. Ziemacki, both of P.O. Box 9407, Winter Haven, Fla. 33880

Filed Oct. 25, 1979, Ser. No. 87,983

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **31 Claims**

1. A needle position indicator for a fuel injector nozzle holder which includes

a needle having upper and lower ends;

a needle seat for engaging the lower end of the needle;

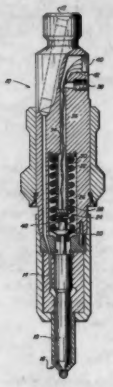
a chamber having an upper end and a lower end through which the upper end of the needle extends;

a spring having a central passageway, said spring positioned within the chamber for exerting a force against the upper end of the chamber and against the upper end of the nee-

dle to bias the needle against the needle seat said needle position indicator comprising:

(a) means positioned within the cavity for generating a magnetic field within the cavity;

(b) a mounting bracket having a body extending through the central passageway of said spring, said bracket



having a lower end adjacent to and in alignment with the upper end of said needle; and

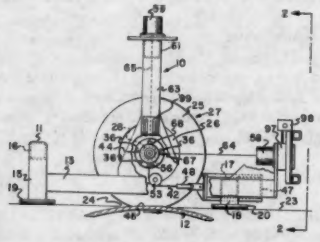
(c) means mounted on the lower end of said bracket for detecting changes in the strength of the magnetic field caused by relative displacements between the needle and the needle seat.

4,359,896

DYNAMIC TIRE TESTING APPARATUS

Jack E. Brown, Jr.; Christopher E. Christie; Joseph M. Forney, all of Akron, and Richard M. Underwood, Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 3, 1980, Ser. No. 212,517
Int. Cl.³ G01M *17/02*
U.S. Cl. 73—146 **20 Claims**



1. A tire testing apparatus for loading and vibrating a tire to obtain data for determining the dynamic properties of said tire comprising:

(a) a stationary structure having a tire supporting surface against which a tread of said tire may be urged;

(b) a supporting fixture for rotatably supporting a wheel on which said tire is mounted for rotation about a tire and wheel axis;

(c) flexible connecting means between said supporting fixture and said stationary structure having a low spring rate in directions generally parallel with said supporting surface;

(d) loading means interposed between said connecting means and said stationary structure to urge said tire against said tire supporting surface;

(e) vibration including means connected to said fixture and said stationary structure for inducing vibration in said tire, said wheel and said fixture; and

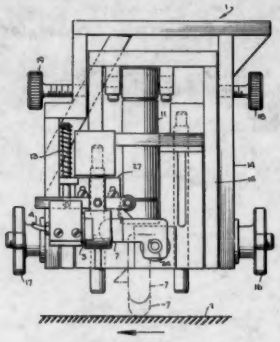
(f) a response measuring means mounted on said fixture providing said data for determining dynamic properties of said tire.

4,359,897

APPARATUS FOR MARKING A ROTATING TIRE

John W. Ugo, Warren, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 238,198
Int. Cl.³ B60C *19/00*
U.S. Cl. 73—146 **2 Claims**



1. Apparatus for marking a rotating tire to identify the location of the maximum radial force variation thereof comprising:

(a) means for supplying a marking substance, said means including a pad member movable between a marking-substance-supplying position and an inactive position and being normally biased toward said inactive position;

(b) marker means including a marker body linearly reciprocally movable between an inactive position and a tire-marking position, said marker means further including a marker head carried by said marker body for pivotal movement between a marking-substance-receiving position in contact with said pad member and an armed-for-marking position at which it can contact said tire when said marker body is moved to said tire-marking position;

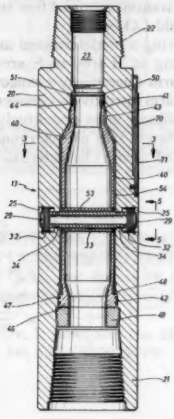
(c) first actuator means responsive to the initiation of a tire testing cycle for pivoting said marker head from said marking-substance-supplying position to said armed-for-marking position; and

(d) second actuator means enabled by the initiation of said tire testing cycle and thereafter responsive to the initiation of a signal identifying the location of maximum radial force variation of said tire for moving said marker body from said inactive position to said tire-marking position, said second actuator means including delay means interconnected with said first actuator means for deactuating said first actuator means in response to actuation of said second actuating means to institute pivotal return movement of said marker head to its marking-substance-receiving position, said return movement being delayed until a point in time immediately following the contact of said marker head with said rotating tire, the pivotal return movement of said marker head and the rotational movement of said tire being in substantially the same direction immediately following the contact of said marker head with said rotating tire.

4,359,898
WEIGHT-ON-BIT AND TORQUE MEASURING APPARATUS

Denis R. Tanguy, Houston, and Larry J. Leising, Rosenberg, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 9, 1980, Ser. No. 214,472
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **20 Claims**



1. Apparatus adapted for use in measuring forces applied to a drill bit during the drilling of a well, comprising:

a tubular body adapted to be connected in a drilling string above the bit and having means defining a radially directed opening in a wall thereof;

means for isolating peripheral wall surfaces of said opening from ambient well fluids and for substantially eliminating regions of stress concentration in said body in the vicinity of said opening resulting from pressures of said ambient well fluids; and

sensor means attached to said wall surfaces for providing an output indicative of a change in the shape of said opening due to forces applied to said body.

4,359,899
WEIGHT ON DRILL BIT MEASURING APPARATUS

Jackson R. Claycomb, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

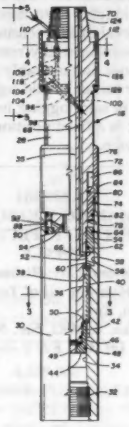
Filed Dec. 19, 1980, Ser. No. 218,317
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **20 Claims**

1. A weight measuring apparatus adapted for measuring the weight load condition in a drilling string while drilling a borehole, comprising:

(a) tubular housing means adapted to be coupled in a borehole drill string and having upper and lower tubular telescopic housing members arranged for limited relative telescopic movement, wherein said tubular housing means has a pressure balancing means between said upper and lower telescopic housing members to offset the effects of relatively high pressure drilling fluid in said housing means that tends to displace said telescopic members apart and the effect of drilling fluid on the exterior of said housing means that tends to displace said telescopic members together;

(b) means between said telescopic upper and said lower housing to sense the longitudinal force load on said housing means including a variable volume fluid chamber situated between said upper and lower housing members and arranged such that the pressure of fluid in said chamber is functionally related to the longitudinal force load on said tubular housing means; and

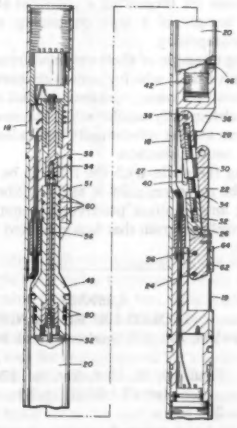
(c) said means to sense also includes a fluid pressure transducer in one of the housing members and in fluid communication with said chamber to sense fluid pressure in said chamber, said fluid pressure transducer being operably connected to a means of transmitting measured data in order to relay this data to drilling equipment at the earth's surface.



4,359,900
APPARATUS FOR MOUNTING A SENSING DEVICE IN A WELL LOGGING INSTRUMENT

Tom A. Garney, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 23, 1981, Ser. No. 256,287
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **6 Claims**



1. In a well logging system having a logging instrument containing a removable sensing device, a means to pass said logging instrument through an earth borehole, and electronic apparatus in said logging instrument and at the earth's surface to operate and monitor said sensing device, an improvement, comprising:

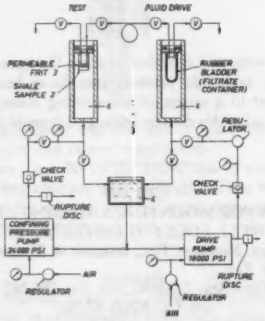
(a) a carriage means longitudinally movable mounted in said logging instrument and removably mountable with one end portion of said sensing device;
(b) a latch and positioning mechanism mounted to said logging instrument and operably connected to said carriage means to displace same between a secured position permitting use of said logging instrument and a released position permitting removal of said sensing device; and
(c) connection means operably removably mountable with said sensing device and operably mountable with an electrical connector means in said logging instrument; and
(d) mount means in said logging instrument adapted to removably mount in a fixed position another end portion of said sensing device.

4,359,901

METHOD FOR MAKING MEASUREMENTS OF THE CHEMICAL SWELLING EFFECT OF A FLUID ON A SHALE

Thomas R. Bates, Missouri City; Richard B. Bonner, and Ronald K. Clark, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 8, 1981, Ser. No. 223,444
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—153 **5 Claims**



1. A process for measuring a chemical swelling effect of a fluid on a sample of a shale-containing subterranean earth formation, comprising:
contacting a sample of shale obtained from said earth formation with a fluid which is, or is substantially equivalent to, the interstitial water contained in said earth formation;
at least substantially equilibrating the so-contacted shale at pressures at least substantially equivalent to those existing in said earth formation;
contacting the shale with the fluid to be tested at substantially the pressures used in said equilibration; and
detecting any resultant positive or negative change in the shale swelling strain that was exhibited during said equilibration.

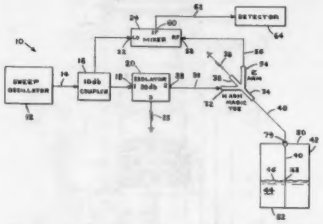
4,359,902

LIQUID LEVEL GAUGE

James C. Lawless, 342-127 Quaker Church Rd., Randolph, N.J. 07869

Filed Jul. 31, 1980, Ser. No. 174,133
Int. Cl.³ G01F *23/28*
U.S. Cl. 73—290 R **3 Claims**

1. A liquid level gauge for measuring the level of liquid within a container comprising:
a waveguide for partial immersion into said liquid, said waveguide having a first end distal from said liquid and a second end adjacent thereto;
means for producing a signal for propagation in said waveguide from said first end, said signal being a periodically sweeping frequency electromagnetic signal sweeping at a predetermined rate over a predetermined frequency range said signal being a first signal having a first frequency at time T_1 and a second frequency at time T_2;
a microwave mixer having an RF port, an LO port and an IF port the operating frequency of said mixer being compatible with the output frequency range of said producing means;
an isolator having an input and an output;
a coupler for receiving said first signal from said producing means and for transmitting said first signal to said isolator input and to said LO port;
a termination having a predetermined impedance;
a magic tee having an H arm, an E arm and two collinear arms, said H arm operatively connected to said isolator output, said E arm operatively connected to said RF port, one of said collinear arms operatively connected to said termination wherein said predetermined impedance is an impedance equal to the characteristic impedance of said



waveguide, the other of said collinear arms operatively connected to said first end of said waveguide;
detection means for detecting the output of said IF port and for converting same to a unit of distance; and,
upon transmission of said first signal having a first frequency at a time T_1 through said coupler and isolator, and through said H arm, said first signal having a first frequency will be transmitted into said first end of said waveguide and, upon reflection of said first signal from said liquid, said reflected signal having said first frequency will be transmitted to said RF port and, upon detection by said mixer at a time T_2 of the signals at said LO and RF ports at a time T_2, said IF port output signal will be corresponding to the difference in frequency between said reflected signal having said first frequency and said second signal and upon detection of IF port output by said detection means the output thereof will correspond to the distance travelled by said first signal prior to reflection and therefore said level of liquid within said container.

4,359,903

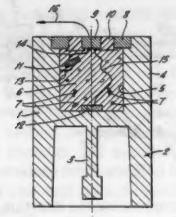
SYSTEM FOR THE IDENTIFICATION OF OBJECTS, FOR EXAMPLE NUCLEAR FUEL ELEMENTS

Serge Crutzen, Orino; Joseph Dal Cero, Brebbia, and Rene Denis, Laveno, all of Italy, assignors to European Atomic Energy Community (EURATOM), Luxembourg

Filed Apr. 8, 1980, Ser. No. 138,347
Claims priority, application United Kingdom, Apr. 24, 1979, 7914203
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—602 **6 Claims**

1. A system for identifying an object or providing an indication of tampering with said object comprising:
a hollow body adapted for attachment to said object;
a matrix material located in said hollow body;
a plurality of inclusions located within said matrix material in a random configuration, at least one of said inclusions being a piezoelectric transducer; and,
at least one electrically conductive exterior portion forming

part of the exterior profile of said body, said exterior portion being electrically connected to said piezoelectric transducer such that said transducer may be connected to an external ultrasonic testing apparatus by means of said electrically conductive exterior portion.



4,359,904

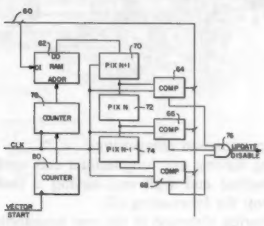
METHOD AND MEANS FOR ELIMINATING FOUNTAIN EFFECT IN AN ULTRASOUND SYSTEM DISPLAY

Gary L. Engle, Fair Oaks, and Robert W. Cribbs, Placerville, both of Calif., assignors to General Electric Company, Rancho Cordova, Calif.

Filed Nov. 3, 1980, Ser. No. 203,660

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—620 **11 Claims**



1. A method of selectively updating pixel data for an ultrasound system display whereby spurious visual effects are minimized comprising the steps of scanning an object with ultrasound transducer means, generating video data in response to signals from said ultrasound transducer means, generating from said video data vectors including data for individual pixels in said system display, comparing pixel addresses of a vector with pixel addresses of a preceding vector, and updating pixel data when a pixel address of said vector is not present in said preceding vector.

4,359,905

WEDGES FOR ULTRASONIC INSPECTION

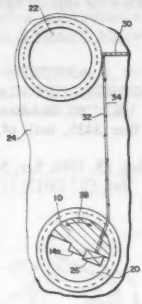
Donald A. Gavin, Rexford, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 1, 1980, Ser. No. 211,591

Int. Cl.³ G01N *29/04, 24/00, 29/00*

U.S. Cl. 73—644 **3 Claims**

1. For use in performing an ultrasonic inspection of the material surrounding a threaded opening in a test device, an ultrasonic inspection apparatus comprising a wedge-like mounting member having a first, threaded surface which is adapted to be screwed into the threaded hole in the test object and a second, mounting surface; and an ultrasonic transducer mounted on said mounting surface, said mounting member being approximately semicircular in cross section and of a size such as to fit within the threaded hole in the test object and to leave space in said threaded hole for said ultrasonic transducer so as to enable rotation of said mounting member within said threaded hole and thus permit the orientation of said ultrasonic transducer relative to the threaded hole to be varied.



4,359,906

DEVICE AND METHOD FOR INSERTING A BONE SCREW

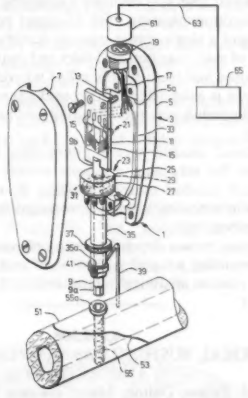
Jacque R. Cordey, Davos, Switzerland, assignor to Synthes AG, Grabenstrasse, Switzerland

Filed May 18, 1979, Ser. No. 40,099

Claims priority, application Switzerland, May 20, 1978, 5460/78; Fed. Rep. of Germany, Dec. 13, 1978, 2853869

Int. Cl.³ B25B *23/14*; G01L *5/24*

U.S. Cl. 73—862.23 **3 Claims**



1. A bone screw driving device adapted for use in orthopedic and traumatologic surgery for tightening a bone screw into bone material to a value M_O which is less, by a predetermined factor, than the torque value at which said bone material irreversibly deforms, said device comprising:

i. a screw driving tool for engaging said bone screw to rotate and apply tightening torque to said bone screw;

ii. means for measuring the amount of tightening torque applied to said bone screw by said screw driving means;

iii. means for measuring the angle of rotation of said bone screw; and

iv. control means for relating the tightening torque applied to said bone screw and the angle of rotation of said bone screw; for specifying a value for M_O as a sum of at least one summand which is a constant, independent of torque, and a summand which is proportional to M/α where α is

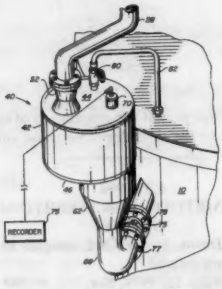
the angle of rotation of the screw measured from the contact of the screw head with an underlying surface, and M is the torque applied as the screw is rotated through α; and for monitoring the applied tightening torque value for M_0.

4,359,907

PROCESS MONITORING APPARATUS AND METHOD

William J. Morin, III, 3202 Knudsen Ave., and Thomas E. Woodford, P.O. Box 3435, both of, Farmington, N. Mex. 87401

Filed Sep. 15, 1980, Ser. No. 186,974
Int. Cl.³ G01N 1/12
U.S. Cl. 73—863.21 8 Claims



1. An apparatus for the continuous monitoring of a process parameter in a process having a process vessel, said apparatus comprising:

(a) a closed reservoir defining a sampling chamber having an inlet communicating with an upper portion of the chamber and a single outlet communicating with a lower portion of said chamber, said inlet and outlet being oppositely disposed and transversely offset whereby a turbulent flow pattern is established within said chamber;

(b) first conduit means connecting said process vessel to said inlet;

(c) second conduit means connecting said outlet to said vessel for returning a sample stream to the vessel, said second conduit means including flow restriction means therein whereby a positive pressure is established in said chamber; and

(d) sensing means depending into said sampling chamber for transmitting a signal indicative of said process parameter to a remote analytical instrument.

4,359,908

ELECTRICAL BUSHING GAS SAMPLING APPARATUS AND METHOD

Arnold M. Perras, Dalton, Mass., assignor to General Electric Company

Filed Dec. 29, 1980, Ser. No. 221,014
Int. Cl.³ G01N 1/10
U.S. Cl. 73—863.85 10 Claims

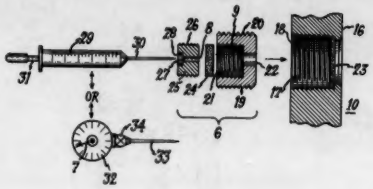
1. An adapter for providing gas sampling facility to an electrical bushing comprising:

a first sealable membrane seated in the fill plug receptacle of an electrical bushing for providing a gastight seal to said bushing;

a first plug member having external threads for threaded engagement in the fill plug receptacle to retain said first membrane therein and an internally threaded bore terminating in a reduced diameter central passage;

a second sealable membrane seated in said threaded bore of said first plug member; and

a second plug member having external threads for threaded engagement in said threaded bore of said first plug member to retain said second membrane therein and a central passage aligned with said central passage of said first plug



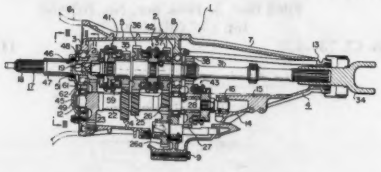
member to accommodate the insertion of a syringe needle through said first and second membranes.

4,359,909

TRANSMISSION

Yoshitaka Sogo, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoto, Japan

Filed Jul. 24, 1980, Ser. No. 171,757
Claims priority, application Japan, Apr. 3, 1980, 55-45144[U]
Int. Cl.³ F01M 9/10; F16H 57/04
U.S. Cl. 74—467 14 Claims



1. In a transmission comprising:

a housing having one longitudinal end wall and the other longitudinal end wall and having a bottom defining a reservoir for lubricating oil;

a first bearing disposed in the one longitudinal end wall of said housing adjacent to the top thereof, a second bearing disposed in the one longitudinal end wall of said housing adjacent to the bottom thereof, and a third bearing disposed in the other longitudinal end wall of said housing in an axially aligned relation to said second bearing;

an input shaft rotatably supported by said first bearing and having one axial end projecting outwardly of said housing and the other axial end projecting inwardly of said housing;

an input gear mounted on the other axial end of said input shaft for rotation therewith;

a counter shaft extending parallel to said input shaft and rotatably supported by said second and third bearings;

a counter gear mounted on said counter shaft for rotation therewith and in mesh with said input gear, said counter gear having at least a portion thereof dipped in the lubricating oil within said reservoir;

a bearing retainer mounted on an outer surface of the one longitudinal end wall of said housing for retaining said first and second bearings in their positions, said bearing retainer having therein an opening through which said input shaft extends; and

a seal member disposed between said bearing retainer and said input shaft for sealing a clearance between said opening in said bearing retainer and said input shaft;

the improvement which comprises:

a chamber defined between said bearing retainer and an end surface of said first bearing facing said bearing retainer, said seal member being exposed to said chamber;

oil-receiving means disposed within said housing adjacent to said input gear for receiving the lubricating oil scooped up

by said counter gear when said input shaft is rotated to cause said counter gear in mesh with said input gear to be rotated; and

a passage for communicating said oil-receiving means and said chamber with each other to introduce the lubricating oil from said oil-receiving means into said chamber for lubricating said seal member and said first bearing,

said transmission further comprising a second chamber defined by and between said bearing retainer and said second bearing, and a second passage for communicating said first-mentioned chamber and said second chamber with each other to introduce lubricating oil from said first-mentioned chamber into said second chamber for lubricating said second bearing.

4,359,910

SHIFT MECHANISM FOR POWER TRANSMISSIONS

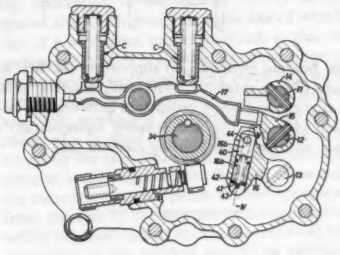
Akio Numazawa, Nagoya; Hideaki Koga, Toyota, and Satomi Suzuki, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Aug. 11, 1980, Ser. No. 177,233

Claims priority, application Japan, Aug. 9, 1979, 54-101542

Int. Cl.³ F16H *57/06;* **G05G** *5/10*

U.S. Cl. 74—476 **5 Claims**



1. In a shift mechanism for a change-speed gearing in a power transmission unit of an automotive vehicle, including a plurality of fork shafts slidably supported from the transmission casing of said unit through a shift restriction mechanism in such a manner that any one of said fork shafts is selectively shifted by a shift-and-select lever along the fore-and-aft axis of the vehicle while the remaining fork shafts are locked in their neutral positions; a reverse shift fork member operatively connected to a first fork shaft selected from said fork shafts, said reverse shift fork member being arranged to shift a reverse idler gear toward and away from reverse drive and output gears for establishing a reverse gear train; and a shift head member fixed to a rearwardly extended portion of said first fork shaft, said shift-and-select lever being arranged to be engaged with said shift head member in its selecting operation and to shift said first fork shaft in the forward direction so as to establish the reverse gear train;

the improvement comprising:

a spring loaded movable element slidable within said shift head member to be pushed inwardly by engagement with said shift-and-select lever; and

a stopper pin integral with said movable element and movable between a first position in which said movable element is apart from said lever and a second position in which said movable element is engaged with said lever, said stopper pin being arranged to face at its outer end to a stationary member in its first position so as to restrict forward movement of said first fork shaft and to be aligned with a recessed portion of said stationary member to permit the forward movement of said first fork shaft.

4,359,911

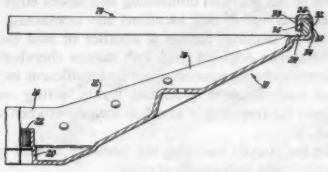
NON-WELDED STEERING WHEEL AND METHOD OF MANUFACTURE

Kenneth B. Eubanks, Dayton, and Clifford E. Loeb, Brookville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 967,288, Dec. 7, 1978, abandoned. This application Sep. 16, 1980, Ser. No. 187,812

Int. Cl.³ B62D *1/04*

U.S. Cl. 74—552 **2 Claims**



1. A non-welded steering wheel comprising, in combination, a split generally circular rim having a solid cross-section, a body portion including at least one spoke having an integral generally planar intermediate flange and an angularly related integral U-shape terminal flange including spaced openings in a portion thereof, said intermediate and terminal flanges forming an integral one piece unit with said spoke, the portions of the rim on each side of the split seating against the intermediate flange and against the portion of the terminal flange including the spaced openings, the terminal flange being wrapped around the portions of the rim on each side of the split, the terminal flange and intermediate flange substantially encircling such portions of the rim and clamping such portions to the intermediate flange and terminal flange, the portions of the rim on each side of the split being extruded from one side thereof through the rim and outwardly of an opposite side thereof, and completely within the openings of the terminal flange to provide integral rivets which integrally rivet such portions of the rim to the terminal flange and cooperate with the clamping of such portions to the intermediate flange and terminal flange in securing the rim to the spoke in a non-welded manner.

4,359,912

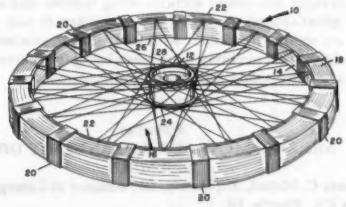
SUPERFLYWHEEL ENERGY STORAGE DEVICE

Thomas R. Small, Brookeville, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Apr. 27, 1979, Ser. No. 34,160

Int. Cl.³ F16C *13/00, 15/00;* **F16F** *15/30*

U.S. Cl. 74—572 **31 Claims**



1. An inertial energy storage rotor device for rotation about an axis defined by a shaft comprising:

hub means for attachment to said shaft, said hub means having upper and lower edge portions;

rim means having upper and lower edge portions, said hub means being disposed within an area defined by said rim means;

spoke means for mounting said rim means to said hub means,

said spoke means comprising a single length of filament, said filament being wrapped partially around at least a portion of said rim means at a first plurality of locations around said rim, said filament passing from each of said locations to another said location and over a portion of said hub means in between said locations in a repetitive fashion forming a plurality of spoke portions, each of said spoke portions contacting said upper edge of said rim means at one of said locations also contacting said upper edge of said rim means at another one of said locations and said lower edge of said hub means therebetween, each of said spoke portions contacting said lower edge of said rim means at one of said locations also contacting said lower edge of said rim means at another of said locations and said upper edge of said hub means therebetween, said locations being spaced apart and sufficient in number so that said filament produces forces acting on said hub means for trapping of said hub means between said spokes; and

means for fixedly securing the portions of said spokes contacting said hub means thereto.

4,359,913

PISTON PIN ASSEMBLY

David J. Mahlke, St. Charles, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jun. 22, 1978, Ser. No. 917,786
Int. Cl.³ G05G *1/00*
U.S. Cl. 74—579 E **1 Claim**

1. In a piston pin assembly particularly adapted for joining a connecting rod to a pistonhead having high performance characteristics, and improvement therein comprising,

a body having an elongated cylindrical-shaped outer surface and a hollow inner space defined by a cylindrical-shaped center section of a selective length joined on each side by contiguous cylindrical-shaped intermediate sections having a diameter greater than said center section to provide stops at the juncture of said sections,

said hollow inner space further being defined by cylindrical-shaped outer sections contiguous with the outer ends of each said intermediate sections, each said outer sections having a diameter greater than said intermediate sections to provide a body having a maximum deflection resistant-weight ratio,

said outer and center sections being hollow, and solid cylindrical-shaped inserts tightly positioned in said intermediate section in contact with said stops to minimize deflection of said pin body upon loads being transferred between said connecting rod and said pistonhead.

4,359,914

ARRANGEMENT FOR A PLANETARY DRIVE ASSEMBLY

Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 25, 1978, Ser. No. 937,004
Int. Cl.³ F16H *3/44, 57/10*
U.S. Cl. 74—788 **13 Claims**

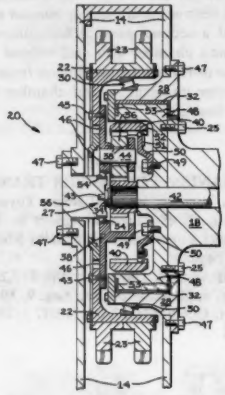
1. A drive assembly (20), comprising:

a driven member (22);

a planetary gear assembly (27) having sun gear (34), planet gear (36), carrier (38), and ring gear (40) elements, said carrier element (38) being connected to the driven member (22) for rotating said driven member (22);

a first housing element (28) rotatable relative to said ring gear element (40);

a first bearing element (30) supporting the driven member (22) in rotatable relationship relative to the first housing element (28) and being positioned between and in contact with the driven member (22) and the first housing element (28); and



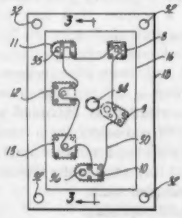
a second bearing element (32) supporting the first housing element (28) in rotatable relationship relative to the ring gear element and being positioned between the ring gear element (40) and the first housing element (28) and in contact with said first housing element (28).

4,359,915

METHOD OF MAKING A PRECISION DIE SET

Agostinho U. Nascimento, 15530 Garrison Line, Southgate, Mich. 48195

Filed Apr. 11, 1980, Ser. No. 139,161
Int. Cl.³ B23Q *3/00*; B21K *5/20*
U.S. Cl. 76—107 R **7 Claims**



1. A method of making a precision die set comprising

(a) mounting a first retainer block upon a die shoe in the proper position by alignment with a punch shoe and applying shear plastic to hold said retainer block in position,

(b) repeating step (a) with a multiplicity of retainer blocks,

(c) securing said retainer blocks to said die shoe by means of a metal top plate,

(d) removing said die shoe assembly from a pedestal, and

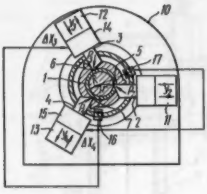
(e) drilling appropriate dowel-receiving and screw-receiving holes.

4,359,916

METHOD OF MACHINING PARTS SHAPED AS BODIES OF REVOLUTION

Vadim B. Pegov, ulitsa Bodraya Novaya, 13, kv. 35; Grigory B. Deich, ulitsa Mescheryakova, 14, kv. 16; Solomon Y. Dvorkin, bulvar Yana Rainisa, 18, korpus 2, kv. 62, and Konstantin V. Ukholov, I Tushinsky proezd, 3, kv. 123,, all of Moscow, U.S.S.R.

Filed Jul. 24, 1980, Ser. No. 172,011
Int. Cl.³ B23B *1/00, 7/00*
U.S. Cl. 82—1 C **5 Claims**



1. A method of machining parts shaped as bodies of revolution by multi-cutter turning, wherein one cutter is a forming one, and the others, non-forming ones, comprising the following operations: arranging said cutters uniformly angularly spaced along a circumference, the axis of which coincides with that of a workpiece being machined, so that the points of said cutters are located in a single, common plane perpendicular to the axis of the workpiece being machined; setting said forming cutter so that the point thereof is spaced radially apart from the axis of the workpiece being machined at a distance equal to the radius of a finished part of the workpiece in a position determined by the specified shape of the finished part of the workpiece in longitudinal section thereof; arranging said non-forming cutters so that the points thereof are spaced radially apart from the axis of the workpiece being machined at distances within the thickness of stock to be removed, but different from the radius of the finished part to be produced, and occupy positions wherein the depth of cut by each said non-forming cutter is less than the depth of cut of said forming cutter by a magnitude equal to the height of surface micro-roughnesses produced by said forming cutter; imparting to all said cutters interrelated radial and longitudinal feed motions.

4,359,917

PORTABLE ON-SITE TURNING APPARATUS

John F. Wilger, Honolulu; Gregory S. Nakano, Pearl City; Tadao Uyetake, Honolulu; Stephen Orillo, Jr., Mililani Town, and Teikichi Higa, Pearl City, all of Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1980, Ser. No. 161,615
Int. Cl.³ B23B *5/00*
U.S. Cl. 82—4 R **10 Claims**

1. A turning apparatus for in-place machining of the surface of a shaft, comprising:

a pair of mounting rings;

radially adjustable means for mounting the rings on the shaft in a concentric spaced relationship thereto;

a longitudinal annulate frame assembly having opposite ends wherein each end is slidably mounted in a respective mounting ring so that the frame assembly can be coaxially positioned on the shaft and rotated;

drive means mounted on at least one mounting ring and operatively coupled to the frame assembly for driving the frame assembly;

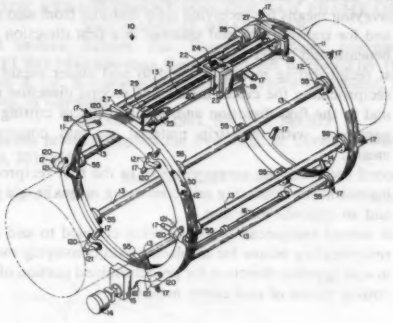
a longitudinal track assembly mounted on and extending between the ends of the frame assembly for rotation therewith, said longitudinal track assembly including:

longitudinal support means having two ends and a plurality of longitudinal orthogonal projections;

a longitudinal bushing shaft attached to each projection; and

retaining means on said frame assembly having a plurality of cylinders adapted for telescopic sliding engagement with the bushing shafts;

a lead screw rotatably mounted on the track assembly and extending between the ends of the frame assembly;



a carrying means mounted on the track assembly for slidable movement therealong and adapted to receive a cutter for machining the shaft;

means mounted on the carrying means for threaded engagement with the lead screw; and

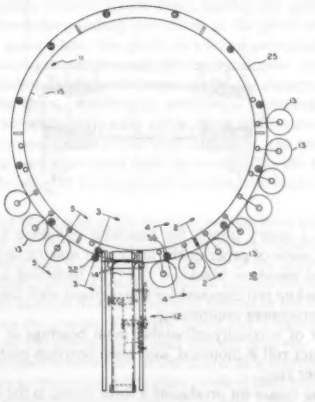
indexing means for incrementally rotating the lead screw in synchronism with the rotation of the frame assembly to thereby move the carriage assembly along the frame assembly.

4,359,918

DIE-CUTTING MECHANISM

Raimond J. Smiltneek, P.O. Box 237, Butler, Wis. 53007

Filed Apr. 16, 1980, Ser. No. 140,811
Int. Cl.³ B26D *5/22;* **B65H** *17/22, 17/46*
U.S. Cl. 83—236 **14 Claims**



1. Apparatus for die-cutting a laminated strip including a carrier ring,

drive means for rotating said carrier ring about a first axis,

a plurality of support means for respectively supporting one of a plurality of rolls of strip material adjacent said ring

and for rotation about a support axis parallel to the axis of said ring,

each support means being pivotally mounted about an axis spaced from and parallel to said support axis for movement toward and away from the carrier ring,

and restraint means on said support means for restricting the rotation of said rolls as said material is discharged onto said ring to produce a torque on the support for pivoting the roll into engagement with the ring,

cutter means spaced from said carrier ring,

conveying means for receiving strip material from said ring and for transporting said material in a first direction and beneath said cutter means,

first reciprocating means coupled to said cutter means for reciprocating the cutter means in a second direction normal to the first direction and into and out of cutting engagement with the strip material on said conveying means,

second reciprocating means coupled to the first reciprocating means for displacing said conveying means in said first and an opposite direction,

said second reciprocating means being coupled to said first reciprocating means for displacing said conveying means in said opposite direction for predetermined portion of the cutting stroke of said cutter means.

4,359,919

ROTARY PUNCH COMPRISING A BACKUP ROLL BEARING ON THE CUTTER ROLL

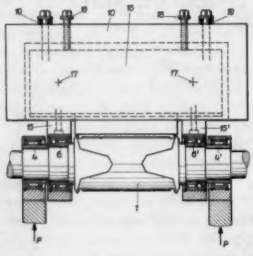
Siegfried Fuchs, and Kurt Stemmler, both of Neuwied, Fed. Rep. of Germany, assignors to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,837

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912458

Int. Cl.³ B26F *1/00*

U.S. Cl. 83—349 **4 Claims**



1. In a rotary punch for punching envelope blanks from moving webs of paper or the like or for making shaped cuts in prepared envelope blanks of the type including a cutter roll and a backup roll disposed for engagement with the cutter roll, the improvement comprising:

a pair of vertically-adjustable main bearings in which said cutter roll is mounted, said main bearings each having an outer ring;

biasing means for producing a force acting in the direction of said backup roll which is operative on said outer rings of said main bearings;

a bridge in which said backup roll is mounted in a preadjustable, non-rotating fixed position; and

supplementary bearings for said cutter roll which contact and abut said bridge.

4,359,920

CUTTER FOR BLOCKS OF WAFERS

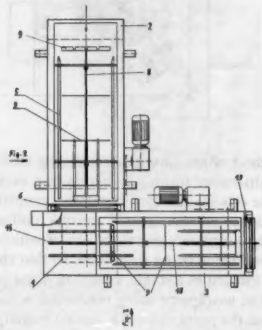
Franz Haas, Sr., Gerstlgasse 25, Wien, Austria (1210); Franz Haas, Jr., Castellezgasse 32, Wien, Austria (1020), and Johann Haas, Wiener Strasse 209-215, Spillern (NÖ), Austria (2104)

Filed Apr. 10, 1980, Ser. No. 139,030

Claims priority, application Austria, Apr. 12, 1979, 2773/79

Int. Cl.³ B26D *1/50, 7/06*

U.S. Cl. 83—404.2 **1 Claim**



1. An apparatus for cutting blocks of wafers comprising:

at least one first cutting member;

first means for transporting blocks of wafers to said first cutting member, said first transport means including a first endless revolving member disposed above the plane of transport of said wafers;

first means for applying pressure to said blocks of wafers in the direction of transport, said first pressure means comprising a plurality of first pressure components mounted on said endless revolving member and extending downwardly therefrom;

wherein the distance between two consecutive first pressure components following each other in the direction of transport is greater than the width or length of the blocks of wafers to be cut;

a second cutting member having a cutting plane arranged at an angle of 90° to said first cutting member;

a second means for transporting blocks of wafers, said second transport means arranged to transport said blocks of wafers from the first cutting member to the second cutting member; said second transport means comprising a second endless revolving member disposed above the plane of transport of said wafers and having a second means for applying pressure to said blocks of wafers, said second pressure applying means comprising a plurality of second pressure components extending downwardly from said second endless revolving member; and

a rack member mounting said first transport means;

wherein said rack member extends parallel to the plane of transport of the blocks of wafers and is movable vertically relative to the plane of transport for causing said first pressure components to move into and out of said plane of transport.

4,359,921

DOUBLE-ACTING CYLINDER-PISTON UNIT FOR A MECHANICAL FRAME SAW

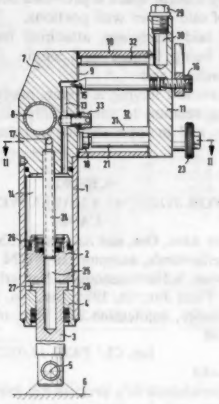
Paul Stolzer, Achern, Fed. Rep. of Germany, assignor to KEURO Maschinenbau GmbH & Co. KG, Achern-Gamshurst, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 245,031

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 8012655[U]

Int. Cl.³ B23D *49/04, 51/20*

U.S. Cl. 83—756 3 Claims



1. In a double-acting cylinder piston unit for controlling the feed motion of a saw blade relative to a workpiece in a mechanical frame saw having a stationary machine frame, a housing part pivotally mounted on the machine frame and a saw frame guide movably mounted in the housing part and carrying a saw blade, the cylinder-piston unit being pivotally connected between the machine frame and housing part and including a cylinder, a piston displaceably mounted in the cylinder and dividing the interior of the cylinder into first and second cylinder chambers, a reservoir containing a hydraulic pressure medium, means defining a hydraulic medium flow path between the reservoir and each cylinder chamber such that hydraulic medium pressure in the first chamber produces a force urging the saw blade toward the workpiece, a respective non-return valve disposed between the reservoir and each flow path for permitting fluid flow from the reservoir into each cylinder chamber, a spring-loaded throttle valve including a valve member and a valve seat disposed in the flow path between the reservoir and the first cylinder chamber for permitting hydraulic medium to flow from the first cylinder chamber when the fluid pressure exceeds a predetermined value, and an adjustable throttle valve disposed in the flow path between the reservoir and the second cylinder chamber for permitting a controlled fluid flow therebetween, the improvement wherein: said piston is pivotally connected to the machine frame; said cylinder is pivotally connected to the pivotally mounted housing part; said cylinder comprises a cylinder head in the form of a block; said reservoir is delimited by one face of said block, a first wall extending from, and substantially perpendicular to, said one face and a second wall spaced from, and substantially parallel to, said face; said block is provided with two bores each defining a portion of said flow path between a respective cylinder chamber and said reservoir; each said bore communicates with its associated valve and forms the seat for said throttle valve communicating with its associated chamber; each said throttle valve member is mounted in said second wall in a manner to be adjustable relative to its associated seat; said means establishing a flow path between said reservoir and said first cylinder chamber comprise a tube extending within said cylinder, along the axis thereof from that bore in said block which forms a part of the same flow path; and said piston is provided with an axially extending bore communicating with said first cylinder chamber, into which said tube extends, and sealing means sealing said piston bore while permitting relative movement, in the axial direction of said cylinder, between said tube and said piston.

4,359,922

GUIDE ARRANGEMENT FOR THE SAW FRAME OF A MECHANICAL FRAME SAW

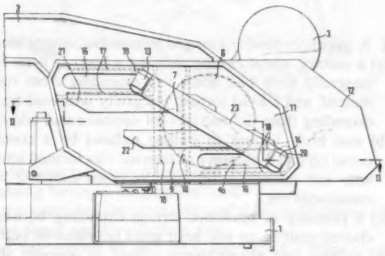
Paul Stolzer, Achern, Fed. Rep. of Germany, assignor to KEURO Maschinenbau Gesellschaft mit beschränkter Haftung & Co. Kommanditgesellschaft, Achern-Gamshurst, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 245,029

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016864

Int. Cl.³ B23D *49/04*

U.S. Cl. 83—759 8 Claims



1. In a system for guiding the saw frame of a mechanical frame saw machine having a crank drive and a stationary machine frame on which the system is pivotally mounted, the saw frame having a front and a back, and the system being composed of a vertically extending, flat inner guide plate pivotally mounted to the machine frame and carrying bearings mounted on bolts, and a guide part having the form of a plate, attached to the saw frame back, and provided with a laterally extending guide surface which bears against the guide plate and slides therealong during movement of the guide part relative to the guide plate, the guide part being provided with a vertical guide groove located, in the horizontal direction, midway between the ends of the guide part for engagement by the machine crank drive, and with two horizontal guide grooves presenting horizontal guide faces and located at respectively opposite sides of the vertical groove, the horizontal grooves and their associated guide faces engaging the bearings of the guide plate to be supported thereby, the improvement wherein:

one of said horizontal guide grooves extends from said vertical groove in the direction of cutting movement of the saw frame and is located at the height of the upper end of said vertical groove, and the other of said horizontal guide grooves extends from said vertical groove in the direction of return movement of the saw frame and is located at the height of the lower end of said vertical groove;

said guide part is provided, at the lateral side thereof which faces away from said guide plate, with at least one further guide surface extending parallel to said guide plate and having a length corresponding to the saw frame stroke; and

said system further comprises a guide beam carried by said bolts to bear against said further guide surface in a manner to brace said guide part relative to said guide plate.

4,359,923

UNITARY GUITAR CONSTRUCTION

James W. Brunet, 215 Vann St., Syracuse, N.Y. 13206

Filed Sep. 28, 1981, Ser. No. 306,266
Int. Cl.³ G10D *1/08*
U.S. Cl. 84—267 9 Claims

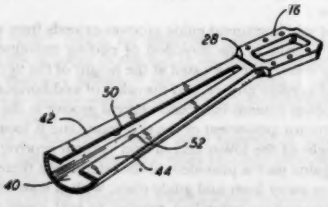
1. A guitar, or similar stringed instrument, comprising:
(a) a unitary, metal casting forming a body, a neck formed integrally with said body and extending from one side thereof, and a head formed integrally with said neck and extending from the end thereof opposite said body;
(b) said body having an outline defined by a continuous metal rib and a plurality of internal ribs formed integrally with and extending through the space enclosed by said continuous rib;
(c) a plurality of tensioned strings extending between anchored position on said head and a tail piece on said body;
(d) at least two planar sheets affixed to opposite sides of certain of said ribs to define an enclosed, hollow chamber underlying said strings between said neck and said tail piece;
(e) a bridge supporting said strings in spaced relation to one of said sheets and affixed to at least one of said certain ribs defining said chamber, whereby vibrations of said strings are transmitted through said bridge and the rib to which it is affixed into said chamber; and
(f) electrical pick-up means mounted upon and supported solely by one of said sheets in spaced relation to said strings and overlying said chamber.

4,359,924

STRINGED INSTRUMENT NECK CONSTRUCTION

James W. Brunet, 215 Vann St., Syracuse, N.Y. 13206

Filed Sep. 28, 1981, Ser. No. 306,264
Int. Cl.³ G10D *3/00*
U.S. Cl. 84—293 9 Claims



1. A neck construction for attachment to the body of a stringed intrument comprising:
(a) a headpiece at one end adapted to support a plurality of string pegs;
(b) means for attaching said neck construction to the stringed instrument body at the end opposite said head piece;
(c) an elongated portion extending between said ends and having a cross section in a plane normal to its axis of substantially uniform thickness and shape throughout its length;
(d) said uniform shape including a curved lower wall portion and a pair of flat, planar upper wall portions extending inwardly for equal distances from each edge of said lower wall portion, said equal distances each being less than one-half the distance between said lower portion edges, whereby a linear space is provided between two opposing edges of said upper wall portions;
(e) all of said headpiece, attaching means and elongated portion being formed as a single, integral and unitary metal casting; and
(f) a fingerboard having a lower, planar surface affixed in covering relation to substantially all of said upper wall portions, and an upper surface carrying a plurality of frets.

4,359,925

PROCESS FOR JOINING A SHELL WITH A CARTRIDGE CASE

Hans-Guenter Abet, Oss, and Adrianus T. Maas, St. Oedenrode, both of Netherlands, assignors to NWM de Kruithoorn B.V., Poeldonkweg, 's-Hertogenbosch, Netherlands

Filed Jun. 18, 1980, Ser. No. 160,497
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1979, 2925138
Int. Cl.³ F42B *11/02*
U.S. Cl. 86—43 5 Claims

1. An improvement in a process for joining a shell having a plastic base portion to a cartridge casing within a joining region which extends in an axial direction between an upper and lower limit of a neck portion of said casing when defined between an inner surface of said neck portion and a confronting cylindrical surface of said plastic base portion; whereby a glueing or synthetic substance having flow capability is introduced into said joining region where it hardens and adheres more strongly to said inner surface of said neck portion of said casing than on said confronting cylindrical surface of said plastic base portion, comprising the steps of
(a) producing at least one groove extending along at least a portion of said confronting cylindrical surface of said plastic base portion between the upper and lower limit of said joining region;
(b) dispensing a dose of said glueing or synthetic substance into a predetermined region of said neck portion;
(c) axially introducing said plastic base portion of said shell into said neck portion of said casing to a predetermined depth while rotating said shell relative to said casing;
(d) transporting at least a portion of said dose of glueing or synthetic substance by means of the transportation effect achieved as a result of the centrifugal and translational forces into said at least one groove in said joining region from said lower limit towards said upper limit; and
(e) letting said synthetic or glueing substance having flow capability harden in said joining region.

4,359,926

WEAPON FIRING SYSTEM INCLUDING WEAPON INTERROGATION MEANS AND STRAY VOLTAGE TESTING MEANS

Frank M. Sano, Wayne; Edward J. Golden, Sussex, and Robert A. Sliwa, Woodcliff Lake, all of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Continuation-in-part of Ser. No. 191,642, Sep. 26, 1980, Pat. No. 4,324,168. This application Mar. 23, 1981, Ser. No. 246,753
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.814 13 Claims

1. A weapon firing system and stray signal testing means, the combination comprising:

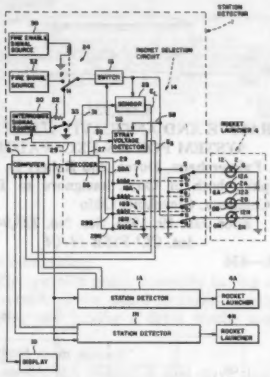
a plurality of weapon select means, each of which is connected to a firing means associated with a weapon in a corresponding plurality of weapons;

a signal source for providing a signal at substantially ground level;

normally open switching means;

means operable for connecting the normally open switching means to the signal source;

control means connected to the normally open switching



means and to the plurality of weapon select means for independently connecting each of the weapon select means to the normally open switching means, and for closing said switching means to pass the substantially ground level signal therethrough which electrically isolates a corresponding weapon firing means; and

a stray signal detector connected between the closed switching means and the independently connected weapon select means for detecting stray signals on the corresponding associated weapon firing means.

4,359,927

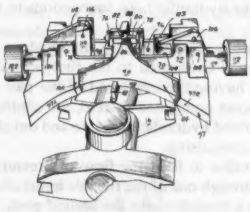
HIGH RATE OF FIRE REVOLVING BATTERY GUN

Douglas P. Tassie, St. George, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Feb. 2, 1981, Ser. No. 230,250

Int. Cl.³ F41D 7/04

U.S. Cl. 89—12 **7 Claims**



1. A Galting type gun comprising:

a housing having a longitudinal axis;

a rotor journaled for clockwise and counterclockwise rotation about said longitudinal axis;

a gun bolt carried by said rotor and having a firing pin and a cocking pin coupled thereto;

firing and safing cam means coupled to said housing and having

a first disposition for causing said cocking pin to cock and to fire said firing pin during clockwise rotation of said rotor,

a second disposition for causing said cocking pin to cock and to fire said firing pin during counterclockwise rotation of said rotor, and

a third disposition for precluding said cocking pin from firing said firing pin during rotation of said rotor.

4,359,928

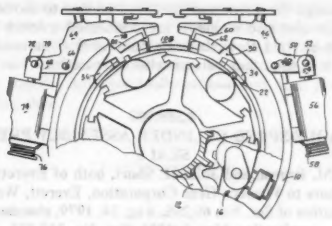
HIGH RATE OF FIRE REVOLVING BATTERY GUN

Quentan T. Sawyer, Milton, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Feb. 2, 1981, Ser. No. 230,559

Int. Cl.³ F41D 7/04

U.S. Cl. 89—12 **5 Claims**



1. A Gatling type gun comprising:

a housing having a longitudinal axis;

a rotor journaled for clockwise and counterclockwise rotation about said longitudinal axis;

a gun bolt carried by said rotor and having a firing pin and a cocking pin coupled thereto;

firing and safing cam means coupled to said housing and having:

a first disposition for causing said cocking pin to cock and to fire said firing pin during clockwise rotation of said rotor,

a second disposition for causing said cocking pin to cock and to fire said firing pin during counterclockwise rotation of said rotor, and

a third disposition for precluding said cocking pin from firing said firing pin during rotation of said rotor,

said cam means including:

two independently operated cam elements and

a continuum cam element and control means to operate said continuum element as a function of the respective dispositions of said two cam elements.

4,359,929

NEGATIVE RATE COMPENSATED HYDRAULIC SERVO SYSTEM

Charles F. Stearns, East Longmeadow, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 23, 1979, Ser. No. 69,140

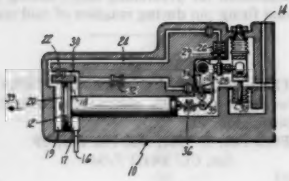
Int. Cl.³ F15B 13/16, 15/17

U.S. Cl. 91—47 **2 Claims**

1. A hydraulic servo system comprising a piston which moves in response to hydraulic fluid pressure and a valve apparatus which is resiliently connected to the piston and which modifies fluid pressure applied to the piston in order to control piston position, said apparatus being movable from a null position in response to a control force for changing fluid pressure applied to the piston to cause the piston to move so as to return said apparatus to said null position, said apparatus characterized by:

two valves; each valve is connected to a source of fluid and containing a movable element which controls fluid flow through the valve and which is resiliently connected to

said piston; a first one of the valves has a negative rate relationship between fluid flow through the valve and the force needed to move the element; the second of the valves has a positive rate relationship between fluid flow



through the valve and the force needed to move the element; and said elements are connected to each other so that as fluid flow through one valve is increased, fluid flow in the other valve is also increased.

4,359,930

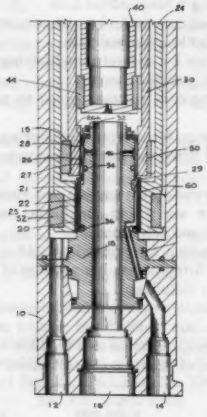
VARIABLE SPEED CYLINDER ASSEMBLY PRESSURE SEALS

Robert M. Brown, and John H. Short, both of Everett, Wash., assignors to Western Gear Corporation, Everett, Wash.

Continuation of Ser. No. 69,266, Aug. 24, 1979, abandoned. This application May 4, 1981, Ser. No. 260,312

Int. Cl.³ F01B *7/20*

U.S. Cl. 91—53 **6 Claims**



1. A selectively actuatable cylinder assembly of the type having an axially extendible inner first ram and at least one outer, hollow, axially extendible second ram having an inside cylindrical surface forming an inner cylinder for the inner ram, an outer cylinder, and axially outer means sealing the rams and cylinders, the improvement comprising axially inner sealing means sealing the inner cylinder from the outer cylinder, said axially inner sealing means including a first seat in fluid communication with actuating fluid for said inner first ram, said outer ram having a second seat in fluid communication with actuating fluid for said outer second ram, and a generally cylindrical, radially expandable sealing bushing interposed between said seats and spaced closely enough to said second seat sufficient to provide a pressure drop along the bushing and opposed second seat when the bushing is in a relaxed condition, said bushing being expandible by the fluid pressure differential of said actuating fluid for said inner ram acting between the bushing and the first seat and between the bushing and the second seat at substantially any magnitude as the fluid passes between said bushing and said second seat, and third sealing means for sealing between the first seat and the opposed face of said bushing for blocking said inner ram actuating fluid from passing axially out past said bushing and first seat into the outer cylinder, said second seat and bushing being moved axially completely past one another when said second ram and bushing are moved axially relative to one another.

4,359,931

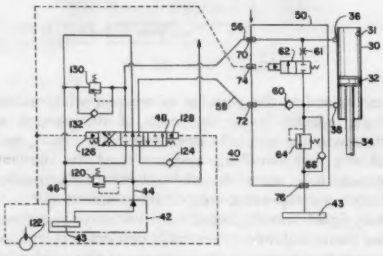
REGENERATIVE AND ANTICAVITATION HYDRAULIC SYSTEM FOR AN EXCAVATOR

Gerard M. Palmersheim, Dover, and Robert D. Breeding, New Philadelphia, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Jan. 19, 1981, Ser. No. 225,941

Int. Cl.³ F15B *13/04*

U.S. Cl. 91—436 **10 Claims**



1. An operator controlled excavator having a hydraulic actuator movable between an extending position and a retracted position in response to pressurized hydraulic fluid introduced through a first port or a second port from a remote hydraulic power source and a reservoir through a pair of flexible hydraulic hoses, the improvement characterized by:

a direction control valve connected to one end of said pair of flexible hydraulic hoses positionable at a first position connecting one of the flexible hoses to the source and the other hose to the reservoir, and at a second position reversing the hydraulic hose connections to the source and reservoir;

valve assembly means directly mounted on the hydraulic actuator and connected to the first port and the second port and having the other end of the pair of flexible hydraulic hoses connected thereto, for controlling the flow of pressurized hydraulic fluid into and out of the hydraulic actuator comprising;

a check valve to limit the flow of pressurized hydraulic fluid through one of the flexible hydraulic hose connection to a direction into the second port,

a two position valve positionable in response to an operator command to a first position permitting pressurized hydraulic fluid flow from the second port and a second position preventing pressurized hydraulic fluid flow therethru into the second port;

control means responsive to an operator for providing a pilot signal; and,

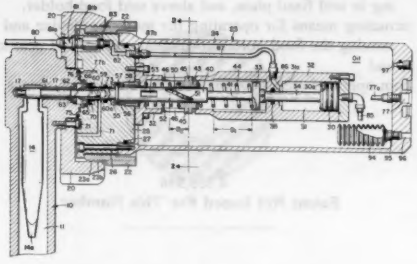
said direction control valve and said two position valve are positionable, at one of their positions in response to a common pilot signal.

4,359,932

HYDRAULIC ACTUATOR

Thomas W. Childers, Mandeville, La., assignor to Exxon Production Research Co., Houston, Tex.

Continuation of Ser. No. 861,061, Dec. 15, 1977, abandoned.
This application Jun. 23, 1981, Ser. No. 276,555
Int. Cl.³ F01B 3/00
U.S. Cl. 92—31 4 Claims



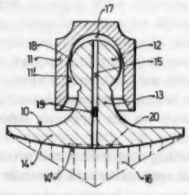
1. Apparatus comprising:
a hydraulically operable piston assembly having a chamber;
a linearly moveable piston means arranged to reciprocate in said chamber and having a drive stroke and a return stroke;
a rotatable drive shaft means;
at least one curved slot formed in said drive shaft means;
a linearly moveable cam means having pin means engageable in said curved slot for rotating said drive shaft means upon movement of said cam means;
a drive spring engaging said piston means and said cam means for moving said cam means in the direction of the drive stroke of said piston means upon movement of said piston means in said drive stroke; and
a return spring engaging said cam means for urging said cam means in the direction of said return stroke of said piston means.

4,359,933

SLIDING PISTON JOINT OF A HYDROSTATIC PISTON MACHINE

Hans-Jürgen Fricke, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 915,064, Jun. 12, 1978, abandoned.
This application Dec. 18, 1980, Ser. No. 217,996
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1977, 2731967
Int. Cl.³ F01B 13/00
U.S. Cl. 92—181 R 12 Claims



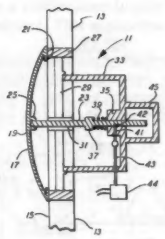
1. A sliding piston joint of a hydrostatic piston machine, comprising a piston having an inner wall section bounding a recess with a closed end end an open end; a sliding shoe having a head portion with a first surface receivable into said recess of said piston and together with said inner wall section of said piston forming a closed cavity at said closed end of said recess, said sliding shoe also having a base portion with a second surface which faces away from said piston and faces toward a hydrodynamic pressure zone generated during operation of the machine at said second surface of said base position, said head portion of said sliding shoe and said piston being in sliding contact with one another; and means for hydrostatically relieving said head portion of said sliding shoe which includes a throughgoing passage extending through said sliding shoe from said base portion to said head portion of said sliding shoe and being open at said surfaces and into said closed cavity at said closed end of said piston, and a variable sealing means formed between the head portion and the inner wall section, so that a portion of working fluid flows through said throughgoing passage from said hydrodynamic pressure zone at said base portion to and outwardly of said head portion of said sliding shoe and into said closed cavity at said closed end of said piston and via said variable sealing means to said open end of said piston to thereby hydrostatically relieve said head portion of said sliding shoe.

4,359,934

EMERGENCY AIR VENT

John Musacchia, P.O. Box 452, Marathon, Fla. 33050

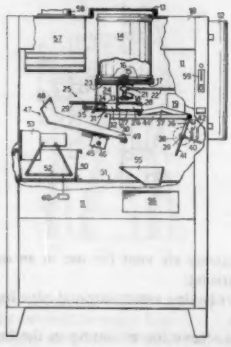
Filed Nov. 24, 1980, Ser. No. 209,547
Int. Cl.³ F24F 13/18
U.S. Cl. 98—118 3 Claims



1. An emergency air vent for use in an outside wall of a building comprising:
a dome cover having a wrap-around edge forming a flat-ring surface;
a cylindrical sleeve for mounting in the building wall and having a diameter substantially equal to the diameter of the flat-ring surface;
a shaft concentrically affixed perpendicularly to the inside of said dome cover;
an outer journal concentrically mounted within said cylindrical sleeve;
a multiplicity of webs extending radially from said outer journal to said cylindrical sleeve to support said outer journal within said cylindrical sleeve;
a mounting frame affixed to said webs and extending outwardly away from said dome cover;
an inner journal mounted in said mounting frame, said shaft being slidably mounted in both said inner journal and said outer journal;

a disc fixedly mounted on said shaft;
a spring mounted on said shaft between said disc and said inner journal, said spring being compressed between such disc and said inner journal when said flat-ring surface is pressed against said cylindrical sleeve;
means for retaining said flat-ring surface pressed against said cylindrical sleeve;
solenoid means connected to said retaining means for releasing said retaining means to permit said spring to force said dome cover away from said cylindrical sleeve;
an electrically-operated detecting means electrically connected to said solenoid means including an oxygen deficiency detector and a smoke detector for actuating said solenoid means;
a battery electrically connected to said detecting means for supplying power to said electrically-operated detecting means; and
a battery charger electrically connected to said battery for maintaining said battery at operating levels.

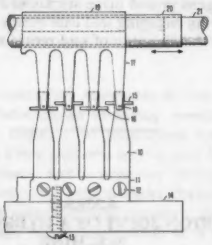
4,359,935
APPARATUS FOR COOKING AND DISPENSING FOOD
Sidney J. Murray, Queensland, Australia, assignor to Ramatian Pty. Ltd., Surfers Paradise, Australia
Filed Jul. 17, 1980, Ser. No. 169,762
Claims priority, application Australia, Nov. 1, 1979, PE1159
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—331 **8 Claims**



1. Apparatus for cooking and dispensing food including:
a container for foods to be cooked and dispensed, said container comprising a barrel having an open bottom, and means for rotating said barrel about its substantially vertical axis,
a fixed plate below said barrel and having an opening through which the food can be dispensed from said barrel,
a cooking unit,
a food holder movable between a first position in or exposed to the cooking unit and a second position clear of the cooking unit, from which it can gravitationally discharge food to a dispensing outlet,
a metering device operable to convey a predetermined quantity of the food from said barrel to said food holder when in its first position,
said metering device including a measuring chamber open at top and bottom and movable over a base member from a receiving position at which it is below said opening in said fixed plate, the bottom of the chamber in such position being closed by the base member, to a discharging position clear of said base member, laterally offset from said opening in said fixed plate, and above said food holder,
actuating means for operating the metering device and for moving the food holder to its first and second positions, and
coin operated means for initiating said actuating means.

4,359,936
Patent Not Issued For This Number

4,359,937
DOT MATRIX PRINTER
Edward F. Helinski, Johnson City, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 7, 1981, Ser. No. 261,396
Int. Cl.³ B41J *3/12*
U.S. Cl. 101—93.04 **2 Claims**



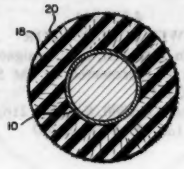
1. A dot matrix printer for forming dot impressions on a print medium which comprises;
a single horizontal row of uniformly spaced cantilevered hammer elements,
said hammer elements alternately having horizontal impactor bars aligned at upper and lower levels and in partial overlapping relation with adjacent impactor bars,
a single horizontal row of uniformly spaced cantilevered print elements alternately having horizontal upper and lower level non-overlapping impact receiving bars positioned opposite said hammer elements and in alignment with corresponding upper and lower impactor bars,
dot print elements on the opposite sides of said print elements,
means for effecting horizontal reciprocation of said print elements with respect to said hammer elements, and
means for actuating said hammer elements whereby selected hammer impactor bars will impact said impact receiving bars to effect transverse deflection of the print elements to form dot impressions on said print medium.

4,359,938

PRINTING ROLLER FOR REMOVING HICKEYS

Edward F. Koren, 6340 A Americana Dr., Clarendon Hills, Ill. 60514

Filed Dec. 19, 1980, Ser. No. 218,114
Int. Cl.³ B41F *13/08, 31/20*
U.S. Cl. 101—148 8 Claims



1. A method of making a printing roller comprising the steps of:

providing a metal roller shaft;

providing an unfelted fiber fabric having a backing and a loose, plush nap the fibers of which have one end bound to said backing and a free end projecting outwardly from said backing at least one inch with a fiber denier of about 6–15;

cementing the fiber fabric backing to said roller shaft;

impregnating the nap fibers and backing with a resilient binder to completely fill the pores in said nap and backing and forming a single layer roller medium extending outwardly from said roller shaft; and

grinding the roller medium surface of the impregnated fabric to raise a nap on the outer surface thereof.

4,359,939

PRINTING DEVICE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

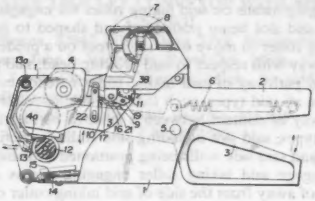
Filed Apr. 21, 1981, Ser. No. 256,114
Int. Cl.³ B41K *5/08*
U.S. Cl. 101—288 18 Claims

1. A printing device for a hand operated label printing machine, comprising:

actuating means comprising a lever; the printing device comprises a frame with respect to which the lever is movable; a printing head and the actuating means lever being movable to relatively move the printing head and a printing medium to effect imprinting of the printing medium by the printing head by moving the printing head and the printing medium together and apart;

a counting device connected with the actuating means lever for counting the number of movements of the actuating means lever for thereby counting the number of imprints effected;

a print stopping mechanism movable to a first position at which the print stopping mechanism permits the actuating means lever to move for effecting imprinting and movable to a second position at which the print stopping mechanism stops movement of the actuating means lever; the print



stopping mechanism being connected to the counting device and the counting device moving the stopping mechanism from the first position of the stopping mechanism to the second position thereof after the counting device counts a certain number of movements of the actuating means;

a print returning mechanism connected with the stopping mechanism for returning the stopping mechanism from the second position to the first position thereof.

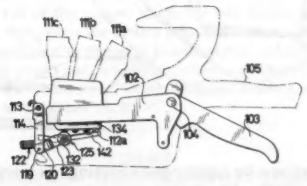
4,359,940

INK SUPPLY DEVICES FOR PORTABLE LABELING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Division of Ser. No. 3,626, Jan. 15, 1979, Pat. No. 4,240,348, which is a continuation of Ser. No. 716,934, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 681,251, Apr. 28, 1976, abandoned. This application May 27, 1980, Ser. No. 153,554

Claims priority, application Japan, Sep. 12, 1975, 50-109929; Oct. 7, 1975, 50-120292; Dec. 20, 1975, 50-151236; Dec. 25, 1975, 50-154012; Feb. 5, 1976, 51-010852
Int. Cl.³ B41K *1/42, 1/46*
U.S. Cl. 101—295 18 Claims



1. An inking device for a labeling machine which prints labels:

said labeling machine comprising:

a frame; a print head in said frame; at least one row of types in said printing head; said types facing toward a print position;

means for moving said printing head toward and away from a label whereby said types may contact the label when said types have been moved to the label;

an actuating lever movably connected to said frame to operate said labeling machine; said actuating lever being connected to said printing head for moving it toward and away from a label;

said inking device comprising:

an inking roller; support and moving means for moving said inking roller across said types as said printing head moves toward the label and while the label is not in contact with said types;

inking roller guide means comprising a slot formed in said frame and extending along said frame past said types; engaging means on said inking roller for engaging in said slot; said slot being positioned and shaped to guide said inking roller to move over said types on a predetermined pathway with respect to said printing head; said predetermined pathway of said inking roller extends completely across all said types, such that said inking roller is out of the way of contact between a label to be imprinted and said types; said slot including side walls for defining said slot, and said side walls being positioned and shaped so as to engage said inking roller engaging means at a side thereof away from the side of said inking roller contacted by said types and for pressing said inking roller against said types and against force exerted by said types against said inking roller as said inking roller rolls by said types such that the cooperative engagement between said slot side walls and said inking roller engaging means is the sole cause of the inking pressure of said inking roller on said types; said slot being shaped and positioned so that said slot side walls remain in engagement with said inking roller engaging means over the entire said predetermined pathway of said inking roller and also to cause said inking roller to press on said types with a desired pressure over said predetermined pathway;

said actuating lever being connected with said inking roller to cause said inking roller to move along said predetermined pathway as said actuating lever is operated.

4,359,941

CHUCKING MEANS FOR PRINTING FORM PLATES

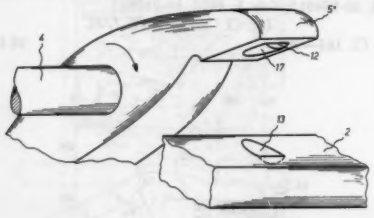
Werner Fels, Kiel, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,435

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1979, 2946597

Int. Cl.³ B41F *27/12*

U.S. Cl. 101—415.1 **10 Claims**



1. Apparatus for register-true chucking of a printing plate on a plate cylinder of a printing press comprising:

a seating surface extending longitudinally of said cylinder,

said printing plate being wrapped around said cylinder with a leading edge thereof lying across said seating surface,

a chuck lever means adjacent said seating surface for holding said leading edge of said printing plate against said seating surface,

said chuck lever means comprising a series of chuck levers mounted for rotation about a common pivot shaft extending longitudinally of said cylinder and each respectively driven by associated articulated link means which are all commonly operated by means of a rotatable shaft extending longitudinally of said cylinder, and

said plurality of chuck levers comprising both first and second types, said second type including punch-type grip means, the articulated link means associated with said first type each including a resilient element, said resilient element being sized and positioned so as to bias the associated chuck levers into clamping position against the leading edge of the printing plate prior to engagement of said second type chuck levers with said printing plate, the articulated link means associated with said second type chuck levers having only rigid, non-resilient elements.

4,359,942

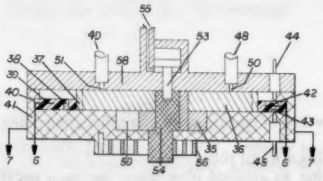
SWITCH ACTUATOR

Albertus E. Schmidlin, Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 15, 1980, Ser. No. 216,417

Int. Cl.³ F42C *15/00*

U.S. Cl. 102—263 **6 Claims**



1. An improved switch actuator for safing and arming a missile:

a housing;

optical transducer means fixedly disposed in one end of the housing for converting a coded optical input pulse signal into a coded electrical signal of the same signature as the optical signal;

amplifier means electrically coupled to the optical transducer means for generating an amplified coded electrical output signal in response to the coded electrical signal;

solenoid means having a magnetically operated flapper valve member pivotally connected therewith, the solenoid means being electrically coupled to said amplifier means for converting the amplified coded electrical signal into a reciprocating mechanical motion of the flapper valve member;

pneumatic supply cover means proximately positioned adjacent to the solenoid means, the pneumatic supply cover means having two pneumatic passageways transversely diametrically disposed therethrough, for alternatively generating, in cooperation with the solenoid means, a coded pneumatic output pulse from each of the pneumatic passageways;

rotating valve plate means operatively disposed adjacent the pneumatic supply cover means, for mechanically decoding each of the coded pneumatic output pulses into sequential pressure pulses;

pneumatic gerotor type prime mover means connected to the valve plate means;

geneva movement means having a driver gear assembly and a follower assembly, the geneva movement means being gear connected to the prime mover means, the geneva driver gear assembly rotating at a predetermined relationship with the prime mover prior to the switch actuator being placed in an armed condition; and

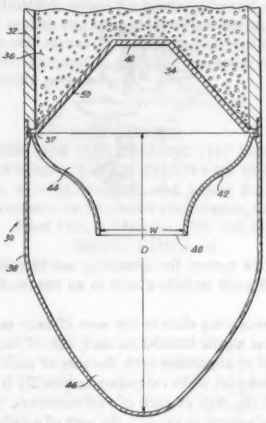
biasing means operatively disposed on the prime mover means intermediate the geneva movement means and the prime mover means for returning the switch actuator to a fail-safe position when the optical transducer means fails to receive a coded optical signal of a specific signature for a given duration.

4,359,943

SHAPED CHARGE WARHEAD INCLUDING SHOCK WAVE FORMING SURFACE

John N. Majerus, Rising Sun, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 2, 1980, Ser. No. 183,651
Int. Cl.³ F42B 1/02
U.S. Cl. 102—309 14 Claims



1. A shaped charge warhead of the type having a concave cavity in front of an explosive for producing a jet of rapidly forward-moving particles preceded by a shock wave and a frontal ogive enclosing said cavity, comprising:

at least one shaped surface in said frontal ogive forward of said cavity dividing said frontal ogive into an inner region and an outer region;

said shaped surface having a central opening therein communicating said inner and outer regions; and

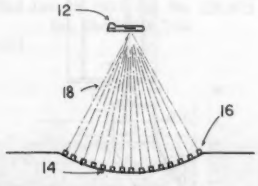
the shape of said surface and the location and size of said opening being effective to produce regions of reflected shock which interact with said jet to modify at least one characteristic of said jet.

4,359,944

AIRCRAFT OVERPRESSURE TRAP

Patrick J. G. Stiennon, 2227 Van Hise Ave., Madison, Wis. 53705

Filed Jul. 21, 1980, Ser. No. 170,775
Int. Cl.³ F42B 23/18
U.S. Cl. 102—405 6 Claims



1. An apparatus for destroying airborne vehicles with an overpressure wave, which comprises:

a. a multiplicity of explosive charges;

b. a rigid surface;

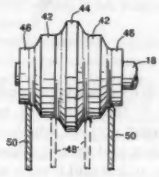
c. a means for detonating said explosive charges, which are placed on said rigid surface and detonated, so that the overpressure wave from each explosive charge reaches a focus at the same time, whereby an aircraft at said focus is impinged upon by the sum of the overpressure waves from each of the multiple explosive charges.

4,359,945

GRAVITY TROLLEY CONVEYOR WITH SPEED CONTROL

John H. Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010, and John L. Vaphiadis, Royal Oak, Mich., assignors to F. Jos. Lamb Company, Warren, Mich., by said John L. Vaphiadis, a part interest

Filed Dec. 10, 1980, Ser. No. 215,029
Int. Cl.³ B61B 3/00
U.S. Cl. 104—89 12 Claims



1. A gravity conveyor comprising first and second downwardly inclined tracks, the first track comprising two resiliently flexible, thin upright rails laterally spaced in generally parallel relation, the second track comprising at least one resiliently flexible, thin upright rail, a trolley suspended from said tracks and adapted to support and convey a workpiece therealong, said trolley comprising a retarder assembly, an arm depending from said retarder assembly and a support member at the lower end of said arm adapted to be loaded with a workpiece, said retarder assembly including a bracket, an axle journalled on said bracket for rotation on a generally horizontal axis, a retarder mechanism operably connected with said axle and responding to the angular velocity of the axle to apply a retarding torque thereto, first and second wheel sets fixed to the axle to rotate therewith, the first wheel set comprising two wheels of the same diameter spaced axially apart on said shaft to correspond with the lateral spacing of the rails of the first track so as to roll on the upper edges of said rails, the second wheel set comprising at least on wheel of different diameter than the wheels of the first set and adapted to roll on the upper edge of the rail of the second track, the two tracks being arranged such that, when the trolley is loaded with a workpiece, the wheel set of smaller diameter is arranged to roll on the rails of one of said tracks and, when the trolley is not loaded with a workpiece, the wheel set of larger diameter is adapted to roll on the rails of the other track.

4,359,946

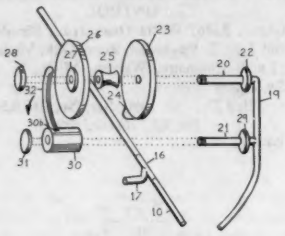
ELEVATED DOWNHILL TRANSPORT SYSTEM

Mark C. Marvin, 25 Floral Rd., Peekskill, N.Y. 10566

Filed Jan. 10, 1978, Ser. No. 868,400
Int. Cl.³ E01B 25/18
U.S. Cl. 104—93 1 Claim

1. A carriage trolley vehicle structure for use as a monorail trolley comprising a fixture suitable for use as a seat, supported by a frame and connected to the frame, a trolley system suitable to be mounted upon and ride along a track, said frame comprised of a means for attaching a fixture suitable suitable for use as a seat, connected to a vertical member and attached to said vertical member and perpendicular to its axis, two parallel axles, the upper axle from its closed end, containing a collar which supports a non-rotating plate, said plate extending from the upper axle to a point below the lower axle, adjacent to said plate, a wheel means capable of riding along a track, and a beveled wheel, beveled toward said wheel means, and

attached to said beveled wheel, a smaller wheel, and said components being secured to the upper axle by a closure, the lower axle from its closed end containing a collar which supports a reciprocating lock lever comprised of a cylinder containing an aperture for mounting on said lower axle and essentially perpendicular to its axis, a lever, said lever resting against said smaller wheel, so that said lever may be dislodged by passing a track support arm, in which case it returns to its original position against said smaller wheel after the passing of said track support, or unless said lever is deliberately manually discharged.



4,359,947

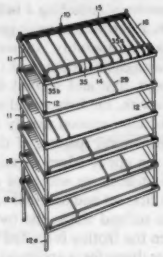
SHELVING ASSEMBLY

Howard J. Marschak, 1202 Crain St., Evanston, Ill. 60202

Filed Mar. 10, 1980, Ser. No. 129,112

Int. Cl.³ A47F *5/12*

U.S. Cl. 108—1 **33 Claims**



1. A shelving assembly comprising a plurality of inclined parallel rectangular metal shelves arranged in vertically-shaped series; each shelf having a support panel and having side edges turned upwardly and then inwardly to define a pair of inturned side flanges parallel with and spaced above said panel; each shelf also having a pair of vertically-aligned openings in said panel and flanges, respectively, adjacent each corner of the rectangular shelf; and a plurality of tubular post segments spacing said shelves adjacent said corners and securing the same together to form said assembly; each tubular post segment having a lower body section and an upper generally cylindrical neck section of reduced cross sectional dimensions; said neck section of each post segment being dimensioned to extend upwardly through a pair of said vertically-aligned openings adjacent the corner of a shelf and terminating in an upper end portion adapted to be received in the body section of the next post segment directly thereabove; said aligned openings of each pair being formed in said panel and side flanges as generally circular openings slightly larger than the outside diameter of said neck sections and substantially smaller than that of said body sections of said post segments.

4,359,948

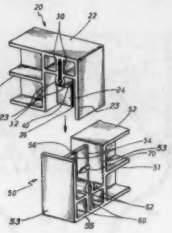
KNOCK-DOWN PALLET AND STRINGER ATTACHING MECHANISM

Paul E. Judy, and John A. Hoffman, both of Howell, Mich., assignors to Paul Judy & Associates, Howell, Mich.

Filed Apr. 7, 1980, Ser. No. 137,842

Int. Cl.³ B65D *19/32*

U.S. Cl. 108—56.1 **14 Claims**



8. An interlock system for attaching and interlocking two members which each include a web in an interlocking region comprising:

(a) member receiving slots in the web of each member,

(b) at least one nipple located on each side of each web and located out of alignment with the axis of each said slot,

(c) a pair of support walls extending outwardly from at least one side of the web of each of said members, the support walls being spaced to receive the web of another member and being located on each side of the axis of the slot, an indent on each support wall and positioned so that when one member is inverted and the receiving slots of two members are brought together, said nipples snap into corresponding indents.

4,359,949

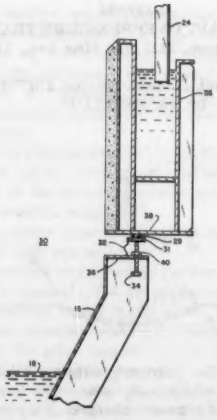
STRUCTURAL WATER SEAL TROUGH

Richard F. Moore, Tolland, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 15, 1981, Ser. No. 311,573

Int. Cl.³ F23J *1/00*

U.S. Cl. 110—171 **1 Claim**



1. In combination, a top-supported furnace in which coal or other ash-bearing fuel is burned, opening means in the furnace bottom, a bottom supported tank opened at its upper end and

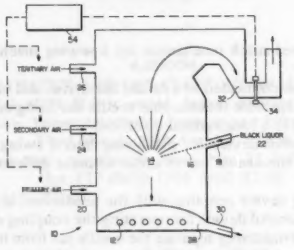
containing water positioned beneath the furnace opening means, into which the ash from the furnace falls, means for removing the ash from the tank, a water-filled trough supported from the bottom independently of the tank, said trough positioned intermediate the furnace bottom and the tank, plate means secured to the furnace bottom extending down into the water in the trough, which plate means completely surround the open upper end of the tank, seal means between the trough and tank which completely surround the open upper end of the tank, and adjustable means for moving the seal means into and out of tight sealing engagement between the trough and tank, wherein the seal means includes a gasket, and a flexible sheet metal member joining the gasket to the upper end of the tank around its entire periphery.

4,359,950

METHOD FOR MAXIMIZING THE REDUCTION EFFICIENCY OF A RECOVERY BOILER

Nils Leffler, London, England, and Kalevi Kaski, Klaukkala, Finland, assignors to Measurex Corporation, Cupertino, Calif.

Filed Oct. 3, 1980, Ser. No. 193,554
Int. Cl.³ F23N *5/18*
U.S. Cl. 110—188 **12 Claims**



1. In a recovery boiler having a plurality of air inputs, with the primary input closest to the bed of said boiler, a fuel input, a smelt output, and an exhaust output, a method of controlling the combustion of fuel in said boiler to operate at the maximum reduction efficiency, said method comprising:

measuring the amount of sulphur dioxide at said exhaust output; and

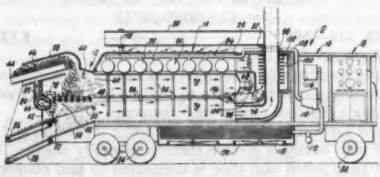
varying the amount of air entering into said boiler through the primary air input until the minimum amount of sulphur dioxide is measured at said exhaust output.

4,359,951

LOW PROFILE PORTABLE POWER PLANT

Hector A. Dauvergne, P.O. Box 884, San Leandro, Calif. 94577

Filed Jan. 26, 1981, Ser. No. 228,472
Int. Cl.³ F23B *7/00*
U.S. Cl. 110—234 **10 Claims**



1. A low-profile solid fuel steam generation plant comprising in combination:

a. a combustion unit having:

(1) a first combustion chamber with a solid fuel bed for preliminary combustion of solid fuel, wherein incompletely combusted volitiles are generated within said first chamber;

(2) a second combustion chamber with an ash bed for complete combustion of combustible residuals of the solid fuel deposited from the first combustion chamber;

(3) means for depositing solid fuel on said solid fuel bed;

(4) means for cycling incompletely combusted volitiles from said first combustion chamber to said second combustion chamber wherein the volitiles are completely combusted, and

(5) means for exhausting completely combusted volitiles; and

b. a boiler unit contiguously arranged with respect to said combustion unit, said boiler unit having;

(1) at least one boiler drum with heat exchange tubes for generation of steam;

(2) a first heat exchange chamber, wherein said tubes of said boiler are exposed in part, said means for cycling incompletely combusted volitiles including means for cycling said volitiles through said first heat exchange chamber before cycling to said second combustion chamber, and

(3) a second heat exchange chamber wherein said tubes of said boiler are exposed in part, said means for exhausting completely combusted volitiles including means for exhausting said volitiles through said second heat exchange chamber;

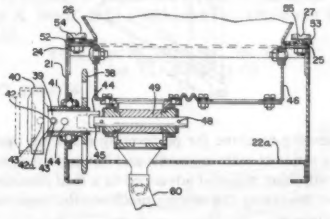
wherein said first heat exchange chamber is constructed and arranged directly above said second heat exchange chamber, wherein said tubes are continuous and pass from said first heat exchange chamber to said second heat exchange chamber.

4,359,952

PLANTER QUICK ATTACHABLE GRANULAR CHEMICAL HOPPER ASSEMBLY

Augustyn M. Gesior, Clarendon Hills, and Edward L. Robinson, Jr., Naperville, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed May 7, 1981, Ser. No. 261,428
Int. Cl.³ A01C *7/06, 7/10, 7/20*
U.S. Cl. 111—80 **6 Claims**



1. In a planter row unit assembly having a frame adapted to be connected to a source of power for towing, a drive train supported from said frame and having a forward end adapted to be connected to a drive and an other end having drive structure rotatably supported on said frame, wherein the improvement comprises:

said frame having a pair of laterally spaced, elongated generally horizontal flanges, stop means extending through each flange, funnel structure supported on said frame, a clutch shaft rotatably supported in said drive structure, and having spaced jaw structure, means for releasably connecting said clutch shaft in a shaft driving and non-driving position to said drive structure and including a hole extending through said drive structure and a pair of laterally spaced holes in said clutch shaft and a pin engageable with said structure and shaft holes for securing the desired shaft driving position wherein the shaft is extended laterally and the non-driving

position wherein the shaft is retracted, a hopper assembly having lower flanged surfaces for engaging said frame flanges and said stop means, and a granular dispenser located in the lower portion of said hopper assembly and having a shaft formed to engage said spaced jaw structure of said clutch shaft in a driving position, said funnel structure being alignable with said dispenser, and fastening means extending between said frame and said hopper assembly for releasably attaching said hopper assembly to said planter assembly.

4,359,953

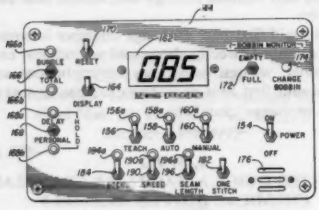
CONTROL SYSTEM FOR SEWING MACHINE

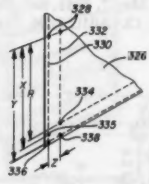
Charles R. Martell; Elmer N. Leslie; Don D. Isett, all of Dallas, and Stephen S. Treadwell, Richardson, all of Tex., assignors to Microdynamics, Inc., Dallas, Tex.

Filed Jul. 14, 1980, Ser. No. 168,525

Int. Cl.³ D05B *19/00*

U.S. Cl. 112—121.11 **32 Claims**





1. In a sewing machine for performing a sewing operation involving a series of seam segments and having a reciprocable needle for stitching material advanced in a feed direction and controls for operating the sewing machine, the improvement which comprises:

means for counting the number of stitches being sewn;

material detection means mounted in spaced relationship with said needle for detecting a material edge following a seam segment;

memory means for storing a plurality of stitch counts corresponding to different seam segments in the sewing operation to be performed;

processing means responsive to said material detection means, said stitch counting means and said memory means for generating first and second output signals, said first output signal stopping said sewing machine a preprogrammed number of stitches after detection of the edge of said material, said preprogrammed number of stitches corresponding to the stitch count stored in said memory means for the particular seam segment being sewn; and

means responsive to said second output signal for performing control of the sewing machine.

4,359,954

SKIPPED-STITCH MECHANISM ON A SEWING MACHINE

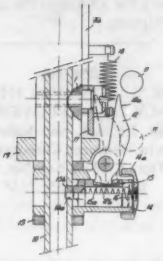
Ernst Dreier, Steckborn, Switzerland, assignor to Fritz Gegauf Aktiengesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland

Filed Jul. 9, 1980, Ser. No. 167,102

Claims priority, application Switzerland, Jul. 17, 1979, 6621/79

Int. Cl.³ D05B *3/02, 69/30*

U.S. Cl. 112—221 **9 Claims**



1. A skipped-stitch mechanism for a sewing machine comprising:

a needle bar connected to a needle bar driver and containing a radial aperture therein, said needle bar being adapted to oscillate in a longitudinal direction,

a first control device for producing lateral swing-out motions of the needle bar in order to make different zigzag stitches,

a coupling device coacting with the needle bar, and

a second control device for operating the coupling device so as to intermittently separate the needle bar from its driving member under the control of a program device, in order to skip the stitching,

said coupling device including a radially movable spring-biased bolt positioned on the needle bar driver and engaging the radial aperture in the needle bar,

a disengaging lever operatively associated with said radially movable spring-biased bolt and operated independently of the lateral position of the needle bar in the upper section of its path of motion by a program-controlled control lever in a direction of disengagement of the needle bar, and

a pawl member provided for the disengaged needle bar and placed on the housing of the sewing machine so as to positively hold the needle bar in its upper final position, said control lever acting simultaneously in its position of disengagement on said pawl member.

4,359,955

DETACHABLE PRESSER FOOT

Kazuo Hida, Tokyo, Japan, assignor to Koshin Seimitsu Kikai Kabushiki Kaisha, Japan

Filed Jul. 16, 1981, Ser. No. 283,888

Int. Cl.³ D05B *29/12*

U.S. Cl. 112—240 **8 Claims**

1. A presser foot comprising:

a presser foot shoe having a first and second support thereon;

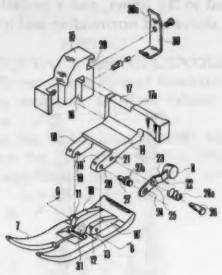
a connecting member adapted to be fixed to a presser foot bar having a first and second limb thereon;

said first support having a knob extending therefrom and said first limb having a groove thereon pivotally engaged with said knob when said shoe is connected to said connecting member;

said second support having a hole therein and said second limb having a hole therein alignable with said second support hole with said shoe connected to said connecting member;

a pin positioned in said holes when they are aligned; and

lever means engaged with said pin including a biasing spring biasing said pin into said second limb hole, said lever means



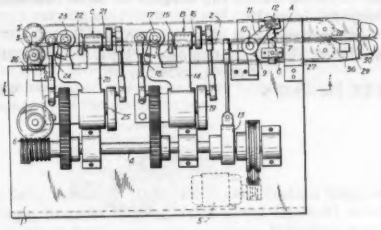
being movable against the bias of said biasing spring to remove said pin from said second limb hole to disengage said shoe from said connecting member.

4,359,956

APPARATUS FOR TOE CLOSURE OF HOSIERY

Tatsuo Sakonishi, Kohriyamashi, Japan, assignor to Tomotake Nakahira, Yamatotakadashi, Japan, a part interest

Filed Nov. 9, 1979, Ser. No. 92,836
Claims priority, application Japan, Nov. 11, 1978, 53/139205
Int. Cl.³ D05B *1/00, 7/00, 27/00*
U.S. Cl. 112—262.2 **4 Claims**



1. A method of closing the toe portion of hosiery comprising:

feeding a circular knit hose in a vertical position with said toe portion on top;

gripping opposed sides of said circular knit hose between first and second opposed elements of an endless conveying device with an upward extending portion of said toe portion extending thereabove;

transferring said circular knit hose gripped in said endless conveying device in a continuous linear motion past first, second and third stations;

removing odds and ends of an upper distal part including odds and ends of said upward extending portion in said first station, and leaving a shortened upward extending portion extending above said endless conveying device;

closing said shortened upward extending portion in said second station with first linking stitches;

stitching said upward extending portion in said third station with second linking stitches which cover said first linking stitches; and then

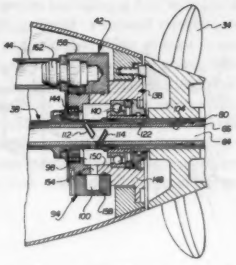
discharging said circular knit hose from said endless conveying device.

4,359,957

TORPEDO AND OPERATING METHOD

J. William Schnabel, South Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 28, 1981, Ser. No. 229,099
Int. Cl.³ F42B *19/14, 19/28*
U.S. Cl. 114—20 A **7 Claims**



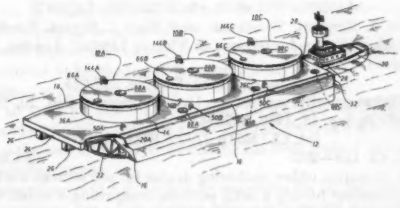
1. A method of discharging a torpedo from a torpedo tube, said method comprising the steps of providing gas under pressure in the torpedo while the torpedo is in the torpedo tube, conducting the gas to an engine within the torpedo, operating the engine under the influence of the gas to move a torpedo drive element in water in the torpedo tube, moving the torpedo out of the torpedo tube under the influence of forces applied against the water in the torpedo tube by the drive element, continuously flowing gas through and discharging gas from the engine during operation of the engine and movement of the torpedo out of the torpedo tube, storing gas discharged from the engine in the torpedo during movement of the torpedo out of the torpedo tube, and initiating a discharge of gas from the torpedo only after the torpedo has moved completely out of the torpedo tube.

4,359,958

CARGO TRANSPORT SYSTEM

Peter D. Durant, 17 Englewood Pkwy., Metairie, La. 70005, and Paul A. Wolff, 2613 Dorchester Dr., Oklahoma City, Okla. 73120

Filed Jun. 28, 1978, Ser. No. 919,955
Int. Cl.³ B63B *25/08*
U.S. Cl. 114—74 A **54 Claims**



1. Apparatus for transporting cargo comprising:

a receptacle adapted to receive a container;

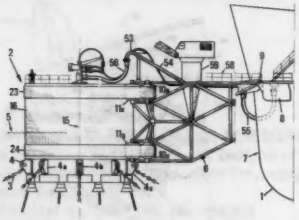
a container having a cargo carrying volume therein, the container being movable with respect to the receptacle from a first to a second position; in the second position the exterior of the container and the interior of the receptacle cooperating to define a cargo receiving volume separate from the cargo carrying volume within the container; and,

a cargo access arrangement for introducing bulk cargo into the cargo receiving volume without removal of the container from the receptacle.

4,359,959
DEVICE FOR MOORING A FLOATING INSTALLATION TO AN ANCHORED OFFSHORE INSTALLATION

Guy R. Delamare, Herblay, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 30, 1980, Ser. No. 117,144
Int. Cl.³ B63B *21/52*
U.S. Cl. 114—230 **8 Claims**



1. A device for mooring a floating installation to an offshore structure of positive buoyancy connected to a stationary point of the water bottom, the offshore structure of positive buoyancy having over at least a portion of its length a cylindrical outer surface of vertical axis, the device comprising:

a rigid connecting arm articulated to the floating installation about a substantially horizontal axis;

roller means provided on said rigid connecting arm, said roller means comprising at least one assembly of at least two substantially coplanar wheels having axes of rotation substantially orthogonal to the axis of articulation of said connecting arm, each one of said at least two wheels located on each side of the longitudinal axis of said connecting arm; and

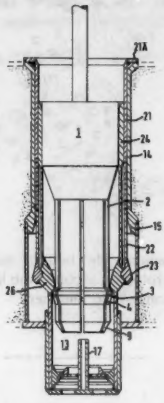
coupling means for maintaining said roller means in contact with said offshore structure of positive buoyancy on a rolling path carried on said offshore structure of positive buoyancy, for permitting relative rotation of said connecting arm and said offshore structure of positive buoyancy about the vertical axis, said coupling means comprising at least one pulley means carried by said connecting arm and having an axis of rotation parallel to the axes of rotation of said wheels, at least one belt means passing around said pulley means and said offshore structure of positive buoyancy, and stretching means for stretching said belt means.

4,359,960
MARINE TETHER ANCHORING DEVICE

Clive J. Burchett, Woodlands, and Nigel J. Bryant, Fareham, both of England, assignors to Vickers Limited, London, England

Filed Jan. 21, 1981, Ser. No. 227,013
Claims priority, application United Kingdom, Jan. 30, 1980, 8003108; Sep. 15, 1980, 8029947
Int. Cl.³ B63B *21/26*; F16B *13/06*
U.S. Cl. 114—294 **2 Claims**

1. A marine tether anchoring device for use with an anchoring chamber having a neck portion, comprising a tether provided with a hollow segmented first spring collet adapted to be inserted into the neck portion of said chamber, said first collet having adjacent its extreme end an inner enlarged cavity, an intermediate section of diminishing width between said cavity and a hollow passage through said first collet, a locking plug extending along said hollow passage and having an end of increased width arranged to be located in said enlarged cavity in a first position, and means for moving said plug between said first position and a second position when said plug engages the intermediate section to open out said first collet and provide a securing of said first collet in the anchoring chamber, said anchoring device further comprising a first slideable sleeve in the neck portion of the anchoring chamber, said first sleeve having a second spring collet, provided with a load ring at its lower end, and which can be expanded to be securely engaged in an uppermost position in said anchoring chamber when tension is applied to the tether, and a second slideable sleeve within said first sleeve and surrounding said hollow segmented

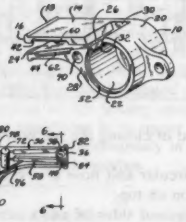


first spring collet, said second sleeve extending to a locking ring arranged to engage between said load ring and outer parts of said intermediate section, in which said load ring can be forced outwards to release said locking ring when said first slideable sleeve is in a lowermost position.

4,359,961
PLASTIC WHISTLE

Suren V. Seron, Joliet, Ill., assignor to Seron Manufacturing Company, Joliet, Ill.

Continuation-in-part of Ser. No. 86,704, Oct. 22, 1979, abandoned. This application Jan. 7, 1981, Ser. No. 223,100
Int. Cl.³ B06B *3/00*
U.S. Cl. 116—137 R **9 Claims**



1. A plastic whistle comprising a main whistle body including a relatively narrow, elongated throat with opposed parts and terminating at one end in a mouthpiece opening and at its other end in an enlarged sound chamber, said throat and said chamber being open along a common side of said body;

an orifice in said body opening to said chamber, said orifice being in a side of said body adjacent said common side and extending thereto;

a closure for said common side having a peripheral size and shape substantially the same as the periphery of said common side, said closure having a side in abutment with said body; said closure side, at the part thereof abutting said one end of said throat, including a tab extending from said side partially into said throat and having opposite sides in abutment with said opposed parts of said body defining said mouthpiece opening to thereby support said opposed

parts against an external clamping force applied by the teeth of a user of the whistle to prevent fracture of said throat; and

means securing said closure of said body.

4,359,962

LOW-FREQUENCY SOUND GENERATOR

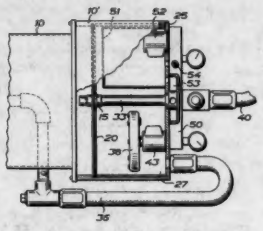
Mats A. Olsson, Bromma, and Roland Sandström, Skelleftea, both of Sweden, assignors to Mats Olsson Konsult AB, Bromma, Sweden

Continuation of Ser. No. 53,560, Jun. 29, 1981, abandoned. This application Aug. 31, 1981, Ser. No. 298,244

Claims priority, application Sweden, Jul. 3, 1978, 7807473

Int. Cl.³ G10K *10/00*

U.S. Cl. 116—137 R **15 Claims**



1. Low-frequency sound generator for generating sound less than 50 cps comprising an open resonator tube **(10)**, a feeder system **(13)** connected at one end of said resonator tube and having a diameter smaller than that of said resonator tube and including a movable valve slide member **(15)** operable to vary the pressure of gas pulses supplied to the resonator tube, said resonator tube having a length equal to one-fourth of the frequency generated, said gas pulses being operable to develop standing sound waves in said resonator tube, said sound waves providing a varying gas pressure in said resonator tube, characterized by means **(20)** in said resonator tube connected to said movable valve slide member operable in response to changes in said pressure to provide positive feedback of the sound pressure in the resonator tube to the feeder system only at a resonant frequency of the resonator tube.

4,359,963

FIXING DEVICE

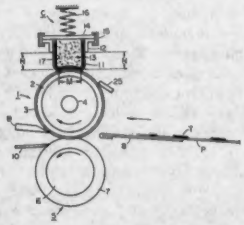
Takashi Saito, Ichikawa; Michio Shigenobu; Tsukasa Kuge, both of Tokyo; Masaaki Sakurai, Hanno, and Hiroyuki Adachi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 141,917

Claims priority, application Japan, Apr. 28, 1979, 54-52637; Apr. 28, 1979, 54-52638; Apr. 28, 1979, 54-52639

Int. Cl.³ G03G *15/10*

U.S. Cl. 118—60 **65 Claims**



1. A device for fixing a toner image on an image supporting member, comprising:

a first and a second roller for conveying the image supporting member therebetween and fixing the toner image on the image supporting member; and

applicator means, in contact with said first roller, for applying offset preventing liquid to said first roller, wherein the contact portion of said applicator means with said first roller includes a first portion in contact with the fixing action area of said first roller and a second portion including the end areas of said first portion, with respect to the lengthwise direction of said first roller;

said applicator means including a first member for retaining offset preventing liquid, a second member, between said first member and said first roller at least in said portion of contact, formed of synthetic resin having fine continuous pores which are effective to allow the offset preventing liquid to ooze out to the surface of said synthetic resin and be applied to said first roller, and a third member, between said first member and said first roller at said second portion, for obstructing the application of offset preventing liquid to said first roller at said second portion.

4,359,964

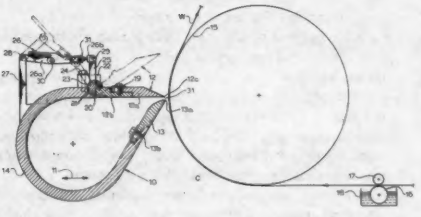
AIR KNIFE COATER WITH PIVOTED LIP

Richard E. Johnson, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed May 20, 1981, Ser. No. 265,634

Int. Cl.³ B05C *11/06*

U.S. Cl. 118—63 **6 Claims**



1. An air knife coater for coating the surface of a traveling web, comprising in combination:

a web supporting carrier over which a traveling web is trained to be supported through a coating zone;

means for applying coating to the web;

an air knife for treating the coating on the web having first and second lips defining an air slot therebetween directed at the web after a layer of coating has been applied by said coating means;

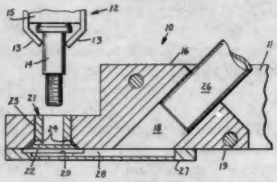
a pivotal support for the first lip mounting the lip for movement between a first position when a precise slot is defined with the other lip and a second position pivoted away from the second lip for cleaning off the distal edge of the first lip and for access to the slot between the lips; said support including a cylindrically shaped base for the first lip extending parallel to the lip and a receiving clamp having a cylindrically shaped socket for receiving the cylinder and providing pivotal support; and

an operating arm connected to the first lip with said arm providing force applying means for moving the lip between said first and second positions and being adjustable for controlling the width of said air slot.

4,359,965
SEALANT APPLICATOR

Thomas N. Bridges, Sr., Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Aug. 13, 1981, Ser. No. 292,649
Int. Cl.[3] B05C 9/02
U.S. Cl. 118—711 4 Claims



1. A sealant applicator assembly for mounting on an automatic fastener installation machine including a movable fastener gripping and installation mechanism, said assembly comprising:

a body member having a bottom surface and at least one upper surface portion;

a first passage means in said body member that extends substantially vertically between said bottom surface and said upper surface portion;

a second passage means in said body member extending from said bottom surface to the exterior of said body member, said second passage means adapted to have a sealant supply connected thereto to deliver sealant to said second passage means;

the openings of said first and second passage means in the bottom surface of said body member being spaced whereby a portion of the bottom surface is located between the openings therein;

a base plate means mounted to the bottom surface of the body member, the area of the body member bottom surface confronted by said base plate means encompassing no less than the openings of the first and second passage means and the bottom surface portion therebetween;

a valve means located within said first passage means which is actuable by the tip of the shank end of a fastener held by said fastener gripping and installation mechanism being forcibly inserted into said first passage means from the upper surface portion of the body member;

and a third passage means in said assembly interconnecting said first and second passage means whereby sealant may flow from the sealant supply to the fastener shank located in the first passage means when the valve means has been opened thereby.

4,359,966
ANIMAL LITTER DEVICE

Alan A. Casino, 5331 Cahuenga Ave., North Hollywood, Calif. 91601

Filed Mar. 30, 1981, Ser. No. 249,334
Int. Cl.[3] A01K 29/00
U.S. Cl. 119—1 1 Claim

1. An animal litter device comprising the combination of:

a base;

a plurality of pointed shaped elements outwardly projecting from one side of said base;

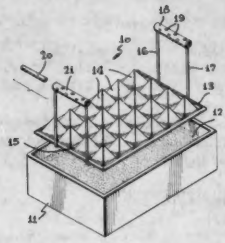
said plurality of elements arranged in parallel rows and columns;

said base provided with a plurality of openings arranged in a pattern adjacent to said plurality of elements;

handle means disposed at opposite ends of said base;

said elements are a plurality of pyramids wherein each of said pyramids having flat sides and said pyramid flat sides are provided with several holes;

deodorant means removably carried on said handle means;

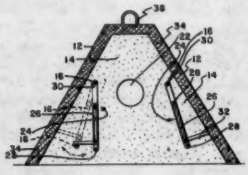


an animal litter box holding a quantity of litter or sand; and said base including said pyramid elements being buried in said litter or sand.

4,359,967
FARROWING HOUSE

Stanley L. Cornelson, Rte. 3, Wellington, Kans. 67152

Filed Jun. 20, 1980, Ser. No. 155,519
Int. Cl.[3] A01K 1/00
U.S. Cl. 119—16 2 Claims



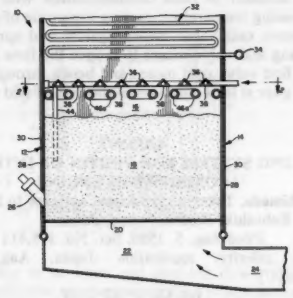
1. A farrowing house for an expectant sow comprising an enclosure having two side walls, two end walls having a structure defining a plurality of rail pivot apertures, and a roof, said side walls essentially defining a truncated "A" in cross section, one end wall having an opening to grade and the other end wall having an opening above grade for ventilation, a crib structure within said enclosure defining two sets of spaced rails having at least one set pivotally connected to said end walls, said sets of rails being spaced upwardly from the grade and forming a means for restricting movement of the sow to the central portion of said enclosure and to said grade opening, each set of rails cooperating with its mating side walls to provide an access area for farrows but precluding access to the sow whereby the farrows are free to nurse and the sow is prevented from lying inadvertently upon the farrows, each of said spaced rails includes a structure defining at least one end member flushing against the face of the end wall and having at least two rail apertures, a first retaining means inserted through one of said rail apertures and received by one of said rail pivot apertures to provide for pivotally swinging said rails with respect to said end walls, a second retaining means inserted through the other of said two rail apertures and received by another of said rail pivot apertures to preclude pivotation and station the rails with respect to said end wall, said at least one end member including an alignment means integrally bound to said at least one end member and abutting a side wall when said rail is pivoted towards a contiguous side wall to facilitate the aligning of a rail aperture with a rail pivot aperture in order that the second retaining means can be inserted therethrough.

4,359,968

FLUIDIZED BED HEAT EXCHANGER UTILIZING A BAFFLE SYSTEM

Robert D. Stewart, Verona, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 10, 1979, Ser. No. 2,160
Int. Cl.³ F28D *13/00*
U.S. Cl. 122—4 D 14 Claims



1. A fluidized bed heat exchanger comprising a housing, grate means supported in said housing and adapted to receive a bed of particulate material at least a portion of which is combustible, means for passing air through said grate means and said bed of particulate material to fluidize said bed of particulate material and promote the combustion of said combustible material, means in the upper portion of said housing for permitting said air and the gaseous products of combustion to exit from said housing, baffle means, including a plurality of spaced baffle members, in said housing disposed between said bed of particulate material and said exit means for impacting with the entrained particulate material in said air and gaseous products of combustion to remove said latter material from said air and gaseous products of combustion and permit said latter material to fall by gravity back to said bed, means in said housing for directing said air and gaseous products of combustion to said baffle means, said directing means including at least one element having sections which are in a staggered, offset relation to the baffle members, and means for injecting a heat absorbing media from the proximity of said baffle means downwardly towards said bed.

4,359,969

METHOD OF IMPROVING THE COMBUSTION OF FUEL CONTAINING HYDROCARBON COMPOUNDS IN THE COMBUSTION CHAMBER OR CHAMBERS OF INTERNAL COMBUSTION ENGINES, AND A LIQUID COMPOSITION FOR CARRYING THE METHOD INTO EFFECT

Allan Mellovist, Baltzarsgatan 8, S-211 36 Malmö, and Thorild N. K. E. Anderberg, Papegojvägen 3, S-230 11 Falsterbo, both of Sweden

Continuation of Ser. No. 908,519, May 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 710,936, Aug. 2, 1976, abandoned. This application May 19, 1980, Ser. No. 150,744
Int. Cl.³ F02B *75/12*
U.S. Cl. 123—1 A 6 Claims

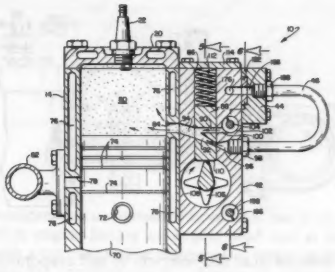
1. A method of improving the combustion of fuel containing hydrocarbon compounds in the combustion chamber or chambers of internal combustion engines in order to reduce fuel consumption and diminish the content of impurities in the exhaust gases of the engine, comprising introducing a liquid composition consisting essentially of 1–10% hydrogen peroxide, 50–80% water, and 15–45% of a C_{1-4} aliphatic alcohol, all by volume, in the form of fine droplets, into the air intake manifold of the internal combustion engine, the air or fuel air mixture in said intake manifold being intimately mixed with the fine droplets of said liquid composition so that said air or said fuel air mixture on entering said combustion chamber contains said liquid composition.

4,359,970

INTERNAL COMBUSTION ENGINE UTILIZING PARTICULATE FUEL

Clemens A. Wolters, Delaware, Ohio, assignor to Clements Corp., Marion, Ohio

Filed Mar. 19, 1981, Ser. No. 245,272
Int. Cl.³ F02B *45/02*
U.S. Cl. 123—23 19 Claims



1. In an internal combustion engine with at least one cylinder having a wall defining a combustion chamber within which a piston is positioned for reciprocal movement, the combination comprising:

intake port means extending through said wall for effecting the passage of particulate solid fuel and air into said chamber;

transport means for transporting said particulate fuel in delivery to a fuel outlet;

air supply means for providing air from a pressurized source thereof to an air outlet selectively spaced with respect to said fuel outlet;

injecting valve means positioned adjacent to and having an outlet communicable with said intake port means, a first duct within said injecting valve means extending from a particulate fuel inlet toward said outlet, a second duct within said injecting valve means extending from a pressurized air inlet toward said outlet and configured to join in communication with said first duct to effect the movement of said particulate fuel with said pressurized air through said injecting valve means outlet, said first duct particulate fuel inlet and second duct pressurized air inlet being located upon said injection valve means for movement therewith into communication with respective said fuel outlet and said air outlet, said injecting valve means being actuable to move with respect to said intake port means, said fuel outlet and said air outlet to selectively effect an intermittent conjoining of said pressurized air from said second duct with said particulate fuel from within said first duct and a substantially simultaneous injection thereof into said intake port means; and

actuating means for selectively actuating said injecting valve means.

4,359,971

STEAM INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Jasper Rogers, 120 N. Val Vista Dr., Mesa, Ariz. 85203

Filed Jan. 28, 1980, Ser. No. 116,276
Int. Cl.³ F02D *19/00*
U.S. Cl. 123—25 P 6 Claims

1. Steam vaporization apparatus for use with an internal

combusion engine having an intake manifold and an exhaust system including an exhaust pipe, said apparatus comprising:

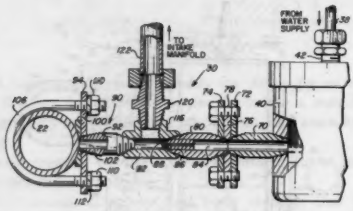
(a) evaporator means defining an evaporator chamber therein;

(b) means for attaching said evaporator immediately adjacent said exhaust pipe in heat exchange relationship therewith;

(c) a reservoir;

(d) a liquid bowl connected to said reservoir and having a float valve associated therewith and an outlet, said float valve adapted to maintain the level in said bowl at or above said outlet;

(e) first conduit means connecting said bowl to said evaporator whereby gravity flow of water is substantially continu-



ally induced from said reservoir to said evaporator chamber;

(f) second conduit means connected to said evaporator chamber and in communication therewith connected to the internal combustion engine at the intake manifold thereby establishing a closed system from said reservoir to said manifold; and

(g) flow restrictor means interposed between said float bowl and said evaporator chamber in said first conduit said flow restrictor means comprising a nozzle having a reduced flow passageway diameter whereby water delivered to said evaporatization chamber across said restrictor and is vaporized and delivered to the intake manifold and backflow of steam to the liquid bowl is restricted.

4,359,972

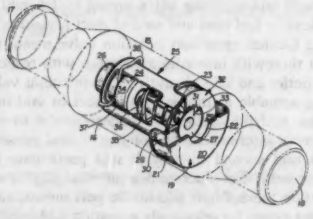
THERMOSTATICALLY CONTROLLED VALVE

Noel C. Calkins, 353 Bryce Ave., Los Alamos, N. Mex. 87544

Filed Jun. 15, 1981, Ser. No. 273,683

Int. Cl.³ F01P *7/16*

U.S. Cl. 123—41.08 **12 Claims**



1. A thermostatically controlled valve which comprises:

(a) an elongated body having an internal chamber and an inlet port and an outlet port opening into said chamber;

(b) first valve port means symmetrically disposed in said chamber normal to the axis between said inlet and outlet ports;

(c) valve means disposed in said chamber and axially movable to and from said valve port means so as to adjust flow rate therethrough;

(d) a spring disposed in said chamber on the inlet side of said first valve port means, said spring axially opposed to said valve means and biasing it toward a valve open position;

(e) a temperature-responsive axial-force actuator fixedly connected to said valve means in the inlet side of said chamber; and

(f) means connected to said first valve port means for holding the end of said actuator opposite said first valve port means in fixed spaced relationship to said first valve port means, said connected means placing said inlet port and said actuator in fluid communication with each other, increasing temperature causing expansion of said actuator to move said valve means against said spring, thereby causing said valve means to reduce the flow rate through said first valve port means and hence through said outlet port over at least a portion of the path of said valve means.

4,359,973

OILING SYSTEM FOR PISTON OF INTERNAL COMBUSTION ENGINE

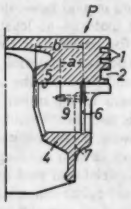
Toshio Shimada, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,411

Claims priority, application Japan, Aug. 9, 1979, 54/103999[U]

Int. Cl.³ F01P *1/04*

U.S. Cl. 123—41.35 **2 Claims**



1. A piston for an internal combustion engine, having in combination: a boss having a radial bore for reception of a piston pin, a depression formed on an outer surface of the piston, the depression having an upper limit being formed by a downward facing wall, said depression extending downward on at least one side of said boss and having a bottom being open, and an oiling hole in said boss extending from the depression near said wall and communicating with said radial bore at a location above an axial centerline going through said bore, wherein said oiling hole has an angle of inclination in reference to a plane normal to an axis of the piston which is less than about 30° downwardly away from said radial bore, said wall having an angle of inclination in reference to a plane normal to the axis of the piston of less that about 15° downwardly away from said boss.

4,359,974

INTAKE MANIFOLD FOR MULTICYLINDER INTERNAL COMBUSTION ENGINE

Toshihiko Igashira, Toyokawa; Hitoshi Yoshida; Ken Nomura, both of Okazaki, and Seiko Abe, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 29, 1980, Ser. No. 173,354

Claims priority, application Japan, Sep. 3, 1979, 54-122018[U]

Int. Cl.³ F02M *29/04, 31/12*

U.S. Cl. 123—52 M **2 Claims**

1. An intake manifold for a multicylinder internal combustion engine having fuel supplying means, comprising:

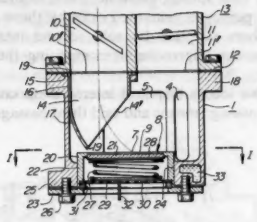
a plurality of branch intake conduits each communicating with one of a plurality of cylinders of the internal combustion engine;

an extension tube connected to a primary suction conduit of

the fuel supplying means and extending within said intake manifold; and

incoming fuel charge heating means located in said intake manifold, wherein the improvement resides in:

said extension tube including a portion within the intake manifold which is smoothly curved downward inwardly towards a bottom surface of the manifold and towards a location within the intake manifold at which axial center lines of said branch intake conduits converge, said curved portion of the extension tube having an outermost wall



terminating in an open end directed down toward and located adjacent to a heating surface of said incoming fuel charge heating means, said open end being disposed in a plane which forms on one side an acute angle with the outermost wall of said curved portion and which intersects an axis of a straight extending portion of the extension tube located above said curved portion, and on an opposite side of said open end extending contiguously with an innermost wall of said straight extending portion located adjacent an entrance of said intake manifold.

4,359,975

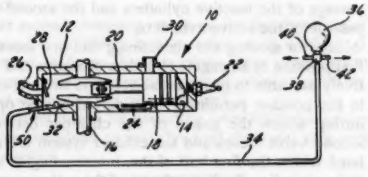
STARTING APPARATUS FOR TWO CYCLE ENGINE

Richard C. Heidner, 704 Spring Dr., West Bend, Wis. 53095

Filed May 25, 1980, Ser. No. 180,879

Int. Cl.³ F02B *33/04*; F02M *1/16*; F04B *39/10*

U.S. Cl. 123—73 R **16 Claims**



1. In an internal combustion engine including a generally closed crankcase adapted to receive a combustion air-fuel mixture from a carburetor during a condition of low pressure,

a cylinder extending from said crankcase,

a piston reciprocally movable in said cylinder, whereby there is alternately developed in said crankcase a low pressure condition as said piston approaches top dead center and a high pressure condition as said piston approaches bottom dead center,

a fuel reservoir remote from the carburetor for supplying liquid fuel to the carburetor to provide a combustible air-fuel mixture to the crankcase, and

a bypass passage extending from said crankcase to said cylinder to permit entry of said mixture into said cylinder as said piston approaches bottom dead center.

the improvement comprising means for pumping the excess liquids accumulated in said crankcase during cranking of the engine into said remote fuel reservoir,

said means including a conduit connecting the crankcase to a point above the normal level of fuel in said remote fuel reservoir, whereby the excess accumulated liquids are pumped into said remote fuel reservoir during cranking at a point above the normal level of the fuel in said remote reservoir.

4,359,976

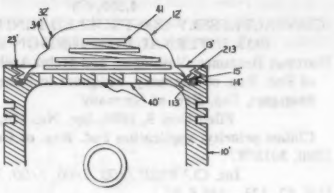
COMPRESSION COMPENSATOR

Harry C. Steele, 2625 Algonquin Ave., Ashland, Ky. 41101

Filed Jun. 17, 1980, Ser. No. 160,240

Int. Cl.³ F02B *75/04*

U.S. Cl. 123—78 B **10 Claims**



1. A compression compensator device for use in an internal combustion engine having an engine head and at least one piston with a top comprising: compensator means on the top of said piston for compensating for changes of compression between the top of the piston and the engine head during operation of the engine; detachable means for securing said compensator means to said piston; said compensator means including a circular flexible disc having a corrugated configuration with alternating ridges and valleys; said disc being made of high heat resistant spring material; said detachable means for securing the disc to the piston including a detachable ring structure; a spiral spring being provided between the inner side of the disc and the top of the piston for reinforcing and improving the operation of said disc during engine operation; and said detachable means including ring structure comprises screw threads provided along the outer circumference of said ring, which mate with complementary threads provided along a recessed portion of the piston top for securing said ring thereto.

4,359,977

HEATER PLUG FOR DIESEL ENGINES

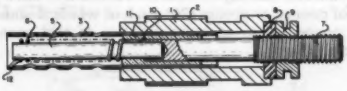
Franz Sperner, Hanau; Fritz Aldinger, Rodenbach, and Wilhelm Zwergel, Freigericht, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Division of Ser. No. 111,433, Jan. 11, 1980. This application Jan. 2, 1981, Ser. No. 222,223

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 2900984

Int. Cl.³ F02B *9/08*; F02P *19/00*

U.S. Cl. 123—145 A **33 Claims**



1. In a diesel engine having a zone for heating or reheating a fuel or air or a mixture thereof, said zone having a heater plug, said heater plug employed as a reheating cold-starting aid for said fuel or air or a mixture thereof, the improvement wherein said heater plug comprises an electrically conductive heater coil connected to an electrically conductive terminal pin, said terminal pin maintained in gas-type manner at least in part within and insulated from an electrically conductive plug

shell, at least the surface of said heater coil formed of a metal of the platinum group, said heater coil supported by a heat resistant electrically insulating rod-like supporting body attached to said terminal pin, said heater coil being surrounded by a heat-resistant electrically conductive protective tube made of a metal and electrically connected at its other end to the end of said electrically conductive protective tube, said protective tube having openings over its circumference of number and size sufficient to permit fuel and air to pass to said heater coil, said protective tube having an opening at one end, said electrically conductive heater coil being electrically insulated along said protective tube, except for the terminal connecting portion.

4,359,978

CONTACTLESSLY CONTROLLED IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

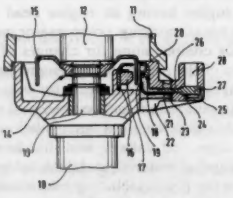
Hartmut Brammer, Vaihingen, and Heinz Leiber, Leimen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,717

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018787

Int. Cl.³ F02P *7/00, 3/06, 1/00, 7/06*

U.S. Cl. 123—146.5 A **4 Claims**



1. A contactless control structure at least partly built into the distributor of the ignition system of an internal combustion engine, said structure including a Hall transducer having a pulse-inducing wheel and also stationary parts, comprising the improvement which consists in that:

all the stationary elements of the Hall transducer are directly integrated without any supplementary casing into the distributor casing;

a connector (**24, 25, 35**) for external connections to the Hall transducer is affixed to the distributor casing (**10, 30**);

the stationary elements of said Hall transducer comprise two magnetically conducting pieces of magnetically soft material, a permanent magnet, a Hall-IC mounted on a ceramic carrier and connection pieces;

said permanent magnet (**17**) and one of said magneticcally conducting pieces (**16**) are directly integrated in the distributor casing;

the other magnetically conducting piece (**18**) said ceramic carrier (**19**) with said Hall-IC and said connection pieces (**21**) are insulatingly case within the distributor casing, and

said connector (**25, 35**) for external connections has a plurality of connector prongs (**24**), each of which is undetachably connected to an individual line of said connection pieces (**21**).

4,359,979

SPLIT ENGINE CONTROL SYSTEM

John Dolza, 810 State St., Fenton, Mich. 48430

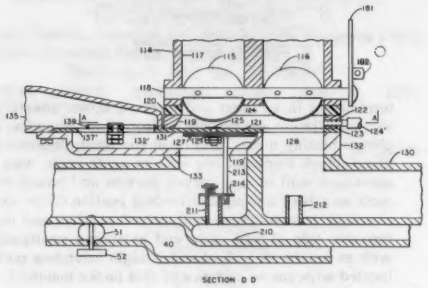
Filed Sep. 10, 1979, Ser. No. 73,886

Int. Cl.³ F02D *17/02;* **F02M** *25/06*

U.S. Cl. 123—198 F **7 Claims**

1. A charge forming system for an internal combustion engine of the type comprising a first and second exhaust passage for alternating cylinders of the engine firing order, the dual exhaust being connected to common catalitic converters, an intake manifold having first passage means communicating with first half of the engine combustion chambers exhausting into the first exhaust passage and second passage means communicating with the second half of the engine combustion chambers exhausting into the second exhaust manifold, an air metering mechanism having third passage means adapted to supply metered air to said first and second intake manifold, passage means, and throttle valve means, said third passage means for controlling the flow of metered air through said air metering mechanism passage means; and a control device for interrupting the flow of metered air from the third passage means to said first intake manifold passage means whereby engine output power is generated only by those engine combustion chambers supplied by said second intake manifold passage means; the improvement comprising the control device having:

A. First valve means disposed intermediate said first intake manifold passage means and said third passage means, said



first valve means including a first position allowing open communication between said first intake passage means and said third passage means, and a second position blocking flow between said first intake passage means and said third passage means, and a second valve means closed at a first position and opened after the second position of the first valve means to communicate with one end of a chamber whose outlet passage is between the first exhaust passage of the inactive cylinders and the second exhaust passage of the active cylinders,

B. Means for moving and maintaining said first means in the first position of all engine cylinders operative and alternatively movable to maintain (above) said first valve means in the position permitting only partial engine operation during which the gasses of the chamber between the second valve means and the exhaust system are recirculated within the first half of the, inactive engine substantially excluding the live exhaust of the active second half of the engine.

4,359,980

ROTATING PISTON ENGINE WITH CONSTANT TORQUE ARM DRIVE OF ITS POWER TAKE-OFF SHAFT

Thomas P. Somraty, 437 Minton Ct., Pleasant Hill, Calif. 94523

Filed Jul. 23, 1980, Ser. No. 171,396

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—245 **43 Claims**

1. A two-cylinder rotary piston internal combustion engine, including in combination:

two interengaging arcuate piston-cylinder assemblies for circular movement on an engine plane, the piston of one assembly and the cylinder of the other assembly reciprocating with respect to each other,

a rotary power take-off shaft on one side of and perpendicular to said plane,

a rotary flywheel shaft coaxial with said power take-off shaft

and perpendicular to and on the other side of said plane therefrom, with a flywheel mounted thereon,

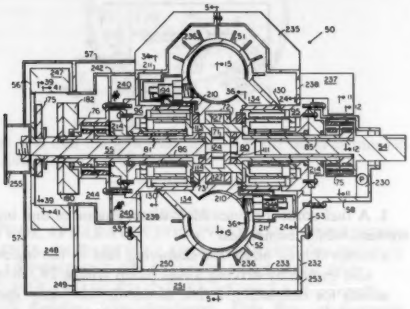
two separate rotary, at least partly hollow, support shafts for each said piston-cylinder assembly, one on each side of said plane and perpendicular to said plane, each rigidly attached to its piston-cylinder assembly,

two said support shafts and the power take-off shaft being concentric, the three said shafts being rotatable relative to each other and supporting each other,

two other said support shafts and the flywheel shaft being concentric, these three said shafts being rotatable relative to each other and supporting each other,

a stationary engine casing surrounding said piston-cylinder assemblies and all said support shafts, said flywheel shaft and said power take-off shaft extending out therefrom,

first clutching means on the power take-off side of said plane for clutching, in alternation, each of the two said support



shafts on that side of the plane to said power take-off shaft, only one said support shaft at a time being clutched to said power take-off shaft, for enabling rotation of said power take-off shaft in a single direction only, and for enabling rotation of each piston-cylinder assembly in a single direction, only, so that during operation each said assembly alternates with the other said assembly in rotating during one stroke and remaining stationary during the next stroke,

similar second clutching means on the flywheel side of said plane for clutching, in alternation, each of the two said support shafts on that side of the plane to said stationary casing and for preventing reverse rotation of those support shafts and the cylinders, and

transmitting means for imparting drive from said piston-cylinder assemblies to said flywheel shaft and vice versa, in alternation.

4,359,981

HIGH COMPRESSION TYPE INTERNAL COMBUSTION ENGINE

Mutsumi Kanda; Kiyoshi Nakanishi, both of Susono, and Katsuhiko Motosugi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 2, 1980, Ser. No. 183,380

Claims priority, application Japan, Sep. 20, 1979, 54-129414[U]

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—263 **7 Claims**

1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

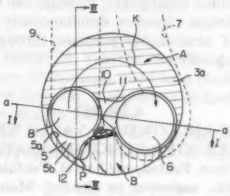
a piston reciprocally movable in said cylinder bore and having a substantially horizontally extending flat top face;

a cylinder head having an inner wall comprising a substantially horizontally extending flat portion and a recessed portion which is arranged at a periphery of said inner wall and has a circumferential wall and a bottom wall, said flat portion being arranged at a position close to the flat top face of said piston positioned at top dead center for forming a squish area therebetween, said piston and said cylinder head forming a combustion chamber therebetween;

a helically shaped intake passage formed in said cylinder head and having an intake valve therein, said intake valve having a valve head which has a front face exposed to said combustion chamber, the front face of said valve head being arranged at a level which is approximately equal to a level of said flat portion;

an exhaust valve arranged on the bottom wall of said recessed portion and having a valve head;

said squish area comprising a first squish area portion and a second squish area portion which are divided by a straight line passing through an axis of said intake valve and an axis of said exhaust valve, said first squish area portion having an area which is about four times the area of said second squish area portion;



a groove formed on said flat portion and extending from the valve head of said intake valve to said recessed portion, said groove having an approximately uniform depth which is slightly larger than the clearance between said flat portion and the flat top face of said piston positioned at top dead center, and;

a spark plug having a spark gap arranged in said groove in the vicinity of said exhaust valve at a position near said second squish area portion and remote from said first squish area portion;

a depression connected to said recessed portion formed on said groove, said depression having an inner wall which is connected to the circumferential wall of said recessed portion and on which the spark gap of said spark plug is arranged, the inner wall of said depression being arranged to be slightly inclined towards said recessed portion with respect to a vertical plane passing through the axis of said intake valve and the axis of said exhaust valve.

4,359,982

THROTTLE VALVE OPENING CONTROLLER

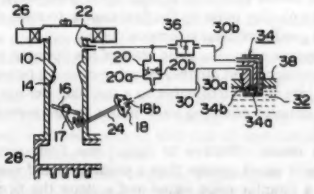
Mamoru Yoshioka, and Takao Tate, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 24, 1980, Ser. No. 171,816

Claims priority, application Japan, Aug. 1, 1979, 54-98806

Int. Cl.³ F02D *33/02*

U.S. Cl. 123—320 **7 Claims**



1. In a throttle valve opening controller for applying retard-

ing forces against the closing force of the throttle valve when the throttle valve is quickly closed, comprising:

a diaphragm device consisting of a diaphragm which is movable in association with the throttle valve when the throttle valve opening is smaller than a specified value, a spring for urging said diaphragm against the closing force of the throttle valve with a force smaller than said closing force, and a diaphragm chamber which is formed on the rear side of said diaphragm and to which atmospheric pressure is admitted through a pressure transmitting valve; and

means for varying the leak rate of air discharged from the diaphragm chamber of said diaphragm device when the throttle valve is quickly closed, which is selectively activated depending on the running condition of the engine;

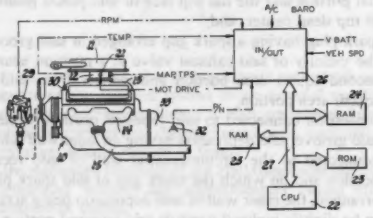
the improvement wherein said means for varying the leak rate is a bypass path provided therein with an orifice and an on-off valve for opening or closing the bypass path through which atmospheric pressure can be introduced to said diaphragm chamber simultaneously with the introduction of atmopheric pressure through the pressure transmitting valve.

4,359,983

ENGINE IDLE AIR CONTROL VALVE WITH POSITION COUNTER RESET APPARATUS

Clifford R. Carlson, Fenton, and Leo H. Voelkle, Keego Harbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1981, Ser. No. 250,316
Int. Cl.³ F02D *1/04*; B60K *31/00*
U.S. Cl. 123—339 **2 Claims**



1. In an engine driven vehicle, the engine being of the internal combustion type including an air induction passage having an idle air control valve positionable by a stepping motor in response to valve opening and valve closing pulses with counter means normally effective to arithmetically count said pulses and retain said count and thereby indicate idle air control valve position but being possibly subject to error in said indication and a stop effective to limit closure of the idle air control valve, counter reset apparatus comprising:

first means effective when actuated to generate a predetermined number of valve closing pulses sufficient to stall the stepping motor against the stop regardless of the actual initial idle air control valve position;

second means effective, at least upon generation of the last valve closing pulse by the first means, to reset the counter to a predetermined reference count;

third means effective, upon reset of the counter, to generate a predetermined number of valve opening pulses to return the idle air control valve to a desired operating position, the counter counting such pulses in the normal manner; and

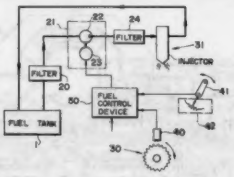
fourth means effective to detect the first occurrence of vehicle speed greater than a predetermined speed following a counter reset signal and actuate the first means in response thereto, the predetermined speed being sufficient to prevent engine stall during the counter reset by this apparatus due to a decrease in vehicle and therefore engine speed initiated after actuation of the first means.

4,359,984

FUEL CONTROL DEVICE FOR DIESEL ENGINE

Kiyoharu Nakao, 380-3 Kamikasuya, Isehara-shi, Kanagawa-ken, Japan

Filed May 20, 1980, Ser. No. 151,648
Claims priority, application Japan, May 25, 1979, 54/64821; May 25, 1979, 54/64822
Int. Cl.³ F02D *11/10, 1/04*
U.S. Cl. 123—357 **23 Claims**



1. A fuel control device for a diesel engine of unit injection system, which comprises:

a motor-driven pump for supplying fuel to the injectors of said engine by driving a fuel pump with a DC motor;

means for outputting a first motor-driven pump speed instruction signal according to a throttle position and an engine speed;

a function generator for outputting a motor-driven pump armature current setting signal according to an engine speed along a torque curve preset for said engine;

a motor speed detecting circuit for detecting an armature current of said motor-driven pump, to output an armature current signal;

an integrator for integrating a difference between said armature current setting signal and an actual armature current signal, to output a second motor-driven pump speed instruction signal; and

a minimum signal priority circuit for outputting a smaller one of said first and second instruction signals in priority, to control the armature current,

whereby the speed of said motor-driven pump is regulated according to an engine speed, for torque regulation of the engine.

4,359,985

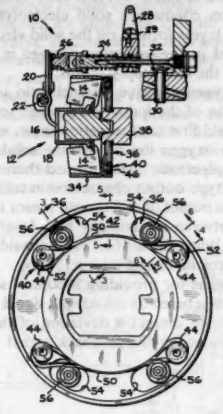
GOVERNOR WEIGHT RETAINER ASSEMBLY FOR FUEL PUMP

Otto Mueller, 13 Byfield La., Dearborn, Mich. 48120

Filed Jan. 23, 1981, Ser. No. 227,684
Int. Cl.³ F16D *3/14*
U.S. Cl. 123—373 **10 Claims**

1. A fuel pump governor having an annular weight retainer member, a hub member, and a flexible connection between the members, characterized in that said flexible connection comprises an elongated wire spring element mounted at its opposite ends as a chord on one of said members, and a follower element mounted on the other member for limited travel on said spring element in response to relative rotation between said members, said follower element and the associated chordal spring ele-

ment being arranged so that as the follower element moves on the spring element in one circumferential direction the spring



element will bias the follower element in the other circumferential direction.

4,359,986

CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR A CORRECTION DEVICE DEPENDENT ON CHARGE PRESSURE FOR SUPER-CHARGED DIESEL VEHICLE ENGINES

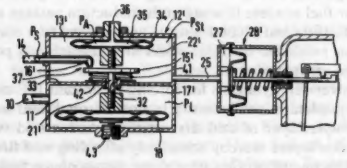
Manfred Krämer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,618

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936162

Int. Cl.³ F02D *1/06, 1/14*

U.S. Cl. 123—383 12 Claims



1. A control apparatus for internal combustion engines, especially a charge-pressure-dependent correction apparatus for supercharged Diesel vehicle engines, said correction apparatus including an adjusting member, a suction tube connected to said correction apparatus, said adjusting member including a movable wall controlled in accordance with absolute pressure of aspirated air from said suction tube and displaceable by a servo air pressure medium connected to said correction apparatus said movable wall arranged to vary an adjustment range or full-load position of a supply quantity adjustment member of a fuel metering apparatus, said correction apparatus further including a valve member, an evacuated diaphragm pressure box, a control means connected to said evacuated diaphragm pressure box which determines the position of said valve member for controlling said servo pressure medium by means of said evacuated diaphragm pressure box exposed to aspirated air pressure, characterized in that compressed air, is used as the servo pressure medium and that the control apparatus comprises a pneumatic pressure converter which reduces the servo air pressure (p_S) to a control air pressure (p_{St}) proportional to the absolute pressure (p_L) of the aspirated air, with the servo air pressure at a higher pressure than the absolute pressure of the aspirated air, said pneumatic pressure converter further includes first and second pressure chambers, said first pressure chamber containing said evacuated diaphragm pressure box which is exposed to aspirated air pressure (p_L), a control diaphragm in said second pressure chamber, said control diaphragm being exposed to the control air pressure (p_{St}) and arranged to function counter to atmospheric air pressure (p_A), means defining an inlet opening in said second chamber which serves to supply the compressed air, and means defining a discharge opening through which compressed air may flow, and further that the flowthrough cross section of at least one of said inlet opening and said outlet opening is variable by said valve member for the purpose of fixing the control air pressure (p_{St}), and that said second pressure chamber communicates with a work chamber, defined by said movable wall, of said adjustment member which functions counter to atmospheric air pressure (p_A).

4,359,987

DIGITAL TIMING SYSTEM

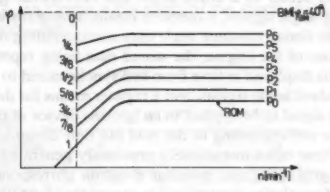
Jurgen Wesemeyer, Nuremberg, and Georg Haubner, Berg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 28, 1981, Ser. No. 229,131

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006633

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—417 6 Claims



1. In an internal combustion engine having a shaft, means rotating with said shaft for furnishing a first signal when said shaft rotates through a predetermined reference position, means (13) for measuring a predetermined operating parameter or said engine and furnishing an input signal corresponding to the so-measured value, and means (11) for furnishing speed signals in response to said first signal: apparatus for approximating a plurality of curves of ignition timing advance angle v. engine speed for different values of said parameter, comprising

storage means (15) having a plurality of addressable storage locations for storing all timing advance angle values with reference to a constant timing advance angle required to approximate one of said curves;

means connected to said speed signal furnishing means and said storage means for reading out a timing advance value from a storage location addressed by said speed signal;

computer means (12, 16, 17, 18, 19) connected to said read out means and said measuring means for

translating said input signal value into a designation of one of a plurality of steps of input signal value to each of which a predetermined proportionality factor is assigned, the proportionality factor 1 being assigned to the input value step corresponding to the value of said parameter for which the timing advance values are stored with reference to said one of said curves in said storage means (15), and

multiplying the timing advance angle signal read out by said read out means by the proportionality factor assigned said input value step designated by said input signal as translated by the computing means, to obtain a

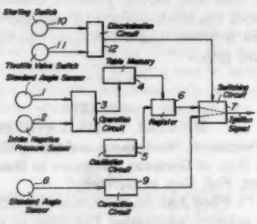
proportionalized timing advance angle signal, and means for producing an ignition timing signal timed to correspond to said proportionalized timing advance angle signal.

4,359,988

IGNITION TIMING REGULATING APPARATUS

Yuji Matsubara, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 11, 1980, Ser. No. 120,098
Claims priority, application Japan, Feb. 16, 1979, 54/16976
Int. Cl.³ F02P 5/04
U.S. Cl. 123—424 **3 Claims**



1. An internal combustion engine ignition timing regulating apparatus provided with a standard angle sensor for detecting a predetermined standard angle which is advanced ahead of a top dead center of a crank angle and in response generating standard angle signals, a memory means having stored therein optimum timing advance angle data corresponding to running conditions of the engine, the stored data being representative of signals displaced in time from and synchronized to timing of the standard angle signals, and a register means for deriving an ignition signal to be applied to an ignition device of the engine at a time corresponding to the read out time duration elapsing from a time of an immediately previously generated standard angle signal, said read out time duration corresponding to a speed of revolution determined in accordance with at least two standard angle signals generated prior to the immediately previously generated standard angle signal, the timing regulating apparatus comprising:

a discriminator means for discriminating starting of an internal combustion engine, and

a switching means for applying a substitute ignition signal to the ignition device at a fixed timing advance angle synchronized to the standard angle signal during starting of the engine discriminated by said discriminating means, said ignition device being energized a first time simultaneously with start of a starter motor, a second time after a fixed time duration following ignition, and thereafter synchronously with and at a time duration following said standard angle signal, said time duration depending upon instantaneous speed of revolution of said engine.

4,359,989

SYSTEM FOR FEEDBACK CONTROL OF AIR-FUEL MIXING RATIO IN INTAKE SYSTEM OF INTERNAL COMBUSTION ENGINE

Kenji Masaki, Yokohama; Kohki Sone, Tokyo, and Sadao Takase, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 20, 1980, Ser. No. 161,405
Claims priority, application Japan, Jun. 22, 1979, 54-78698
Int. Cl.³ F02D 33/00; F02M 7/24
U.S. Cl. 123—438 **11 Claims**

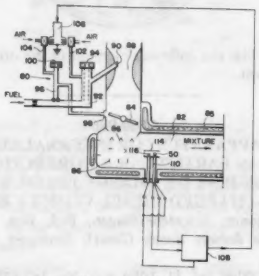
1. A control system for feedback control of the mixing ratio of an air-fuel mixture in an induction passage for an internal combustion engine, the control system comprising:

an electrically controllable fuel supply means for supplying fuel into the induction passage;

a first oxygen-sensitive air/fuel ratio sensor which has an oxygen ion conductive solid electrolyte layer and two electrode layers formed on the solid electrolyte layer and is disposed in the induction passage in a section downstream of the fuel supply means;

a second oxygen-sensitive air/fuel ratio sensor disposed in said section of the induction passage so as to be located close to said first air/fuel ratio sensor, said second sensor having an oxygen ion conductive solid electrolyte layer with two electrode layers formed thereon and exhibiting an on-off type output characteristic such that the magnitude of the output of said second sensor undergoes a sharp change between a maximally high level and a minimally low level when the air-fuel ratio of said mixture changes across a stoichiometric air/fuel ratio;

a control means for providing a control signal to said fuel supply means based on a feedback signal produced by said first sensor to correct a deviation of the air-fuel mixing ratio indicated by the feedback signal from a predetermined mixing ratio, said control means including a discriminating means for interpreting information in said feedback signal with reference to the output of said second sensor;



an ignition means for burning a fractional portion of the air-fuel mixture flowing in the induction passage such that said first and second sensors are exposed to a combustion gas produced by combustion of said fractional portion of the air-fuel mixture; and

a power supply means for forcing a constant DC current of a predetermined intensity to flow through said solid electrolyte layer of said first sensor between said two electrode layers thereby selectively affording said first sensor with one of (a) first type slope output characteristic such that the magnitude of the output of said first sensor gradually varies as the air-fuel mixing ratio varies but remains above said stoichiometric air/fuel ratio, and (b) second type slope output characteristic such that the magnitude of the output of said first sensor gradually varies as the air-fuel mixing ratio varies but remains below said stoichiometric air/fuel ratio.

4,359,990

FUEL INJECTION SYSTEM

Gunter Kromer, Heilbronn; Armin Bauder, and Gerhard Maurhoff, both of Neckarsulm, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 24, 1980, Ser. No. 115,067
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2904976
Int. Cl.³ F02B 3/00
U.S. Cl. 123—453 **7 Claims**

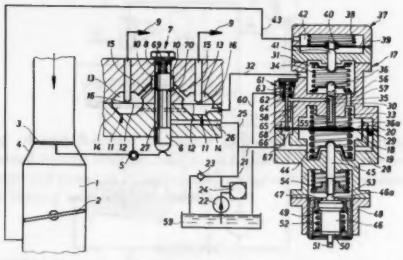
1. A fuel injection system for a mixture-compressing spark

ignition internal combustion engine with continuous injection including an air inlet passage containing an adjustable throttle valve, said fuel injection system comprising:

a flow sensing device for measuring the rate of fuel flow;

a fuel metering valve, actuated by the flow sensing device, in which fuel metering occurs at a controlled constant pressure difference; and

a differential pressure regulating valve which adjusts the fuel metering valve, said differential pressure regulating valve having a first chamber and a second chamber separated from the first chamber by a diaphragm, the first chamber being in communication with a return pipe via a valve element which can be moved in a bore by the diaphragm,



and the second chamber being subject to pressure upstream of the metering valve, said differential pressure regulating valve also having a first spring means acting upon the side of the diaphragm facing the first chamber, and a second spring means acting upon the side of the diaphragm facing the second chamber, said first means comprising a strong spring acting directly on the diaphragm and a contact spring which keeps a movable valve element in contact with the diaphragm wherein the constant pressure difference supplied by the differential regulatory valve to the fuel metering valve is varied in accordance with the operating conditions of the engine by varying the force of the contact spring.

4,359,991

METHOD AND APPARATUS FOR FUEL METERING IN INTERNAL COMBUSTION ENGINES

Gerhard Stumpp; Ludwig Walz, both of Stuttgart; Gerhard Schielinsky, Schwaikheim; Wolf Wessel, Oberriexingen; Thomas Küttner, Stuttgart; Ulrich Flaig, Markgröningen; Fridolin Piwonka, Gerlingen; Hermann Eisele, Vaihingen-Enz; Andreas Boehringer, Stuttgart; Hans Kubach, Korntal-Münchingen; Johannes Locher, and Waldemar Becker, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 163,015, Jun. 25, 1980, abandoned, which is a continuation of Ser. No. 958,086, Nov. 3, 1978, abandoned. This application Jan. 26, 1981, Ser. No. 228,399

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1978, 2803750

Int. Cl.[3] **F02D** *37/02, 5/00;* **F02B** *3/00;* **F02M** *25/06*

U.S. Cl. 123—478 **24 Claims**

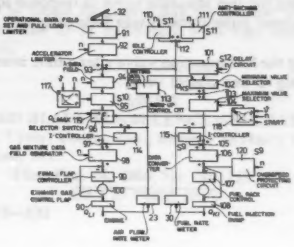
1. A method for controlling the fuel supply to an internal combustion engine equipped with an accelerator pedal, comprising the steps of:

providing a first stored characteristic data field which relates nominal fuel quantity to accelerator pedal position;

monitoring the position of the accelerator pedal, generating a signal indicative thereof and deriving from the generated accelerator pedal position signal and the first stored characteristic data field a nominal fuel quantity signal;

providing a second stored characteristic data field which relates maximum permissible fuel quantity to actual air flow rate;

measuring the air flow rate to the engine, generating a signal indicative thereof and deriving from the generated air flow rate signal and the second stored characteristic data field a maximum permissible fuel quantity signal; and



generating a final fuel quantity control signal from the nominal fuel quantity signal and the maximum permissible fuel quantity signal for regulating a fuel flow control device.

4,359,992

METHOD OF CONTROLLING FUEL SUPPLY TO INTERNAL COMBUSTION ENGINE

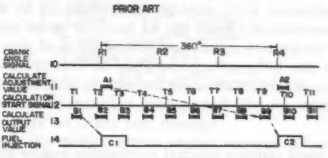
Masaharu Asano, Yokosuka; Hideyuki Tamura, and Shoji Furuhashi, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed May 12, 1980, Ser. No. 148,937

Claims priority, application Japan, May 15, 1979, 54-58677

Int. Cl.[3] **F02B** *3/00;* **F02D** *21/04;* **G06F** *15/20*

U.S. Cl. 123—480 **7 Claims**



1. A method of controlling fuel supply to a multicylinder internal combustion engine having a fuel injection valve and a plurality of sensors for measuring engine operating conditions, comprising the steps of:

(a) measuring engine crankshaft rotation;

(b) producing a crank angle pulse signal on the basis of said crank rotation measurement, the pulses of which signal occur each time the crankshaft rotates through a predetermined angle;

(c) measuring a plurality of other engine operating conditions;

(d) producing information signals indicative of the plurality of the other engine operating conditions;

(e) beginning a calculation of a fuel injection duration adjustment and calculating the adjustment as a function of at least one information signal indicative of engine operating conditions in response to a first pulse of said crank angle signal;

(f) starting a calculation of a basic fuel injection duration and calculating the duration as a function of information signals indicative of engine operating conditions, including crankshaft rotation, after the fuel injection duration adjustment calculation, ending the basic fuel injection duration calculation before the crank angle signal pulse immediately following said first pulse;

(g) starting a calculation of an output value and calculating the value as a function of said basic fuel injection duration

and said fuel injection duration adjustment after said basic fuel injection duration calculation, ending the output value calculation before the crank angle signal pulse immediately following said first pulse;

(h) opening the fuel injection valve in response to the crank angle signal pulse immediately following said first pulse; and

(i) closing the fuel injection valve after a time interval corresponding to said output value.

4,359,993

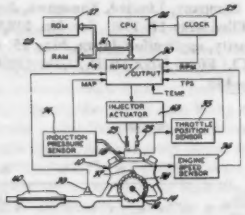
INTERNAL COMBUSTION ENGINE TRANSIENT FUEL CONTROL APPARATUS

Clifford R. Carlson, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1981, Ser. No. 228,136

Int. Cl.³ F02M *51/00*; F02B *3/00*

U.S. Cl. 123—492 **3 Claims**



1. In a spark ignition internal combustion engine having an air induction passage with a throttle therein and means responsive at least to induction passage pressure and engine speed to normally inject fuel into said induction passage upstream from said throttle in quantity appropriate for essentially steady state engine operating conditions, transient fuel control apparatus comprising:

first means effective to measure the time rate of change of throttle position and periodically derive therefrom a first transient fuel correction number, said number being independently calibrated to correct fuel supply for the immediate change in air flow past the throttle with change in throttle position;

second means responsive to the induction passage pressure to derive therefrom a filtered induction passage pressure with a first order lag characteristic;

third means responsive to the induction passage pressure and the second means to derive the time rate of change of the induction passage pressure relative to the filtered induction passage pressure and derive therefrom a second transient fuel correction number, said number being independently calibrated to correct fuel supply for the change in fuel stored in the induction passage with change in pressure therein; and

fourth means effective to modify the fuel injected into the induction passage from said quantity normally injected by an amount derived from the arithmetic sum of the first and second transient fuel correction numbers, whereby accurate transient fuel control is obtained under a variety of engine operating conditions.

4,359,994

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

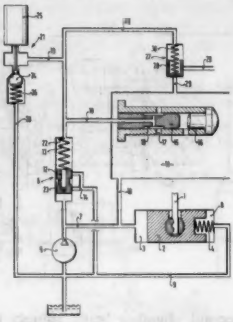
Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg, and Helmut Laufer, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,877

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925418

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—502 **7 Claims**



1. A fuel injection pump for internal combustion engines having an rpm governor with an adjustment member actuated in accordance with load and rpm and further including a supply pump, the pressure of which is exerted upon an injecting adjustment piston having a high pressure side for the purpose of adjusting fuel injection onset, wherein said pressure is controllable on the one hand via a pressure control valve in proportion to rpm and on the other hand via a first discharge valve (17, 18) actuated in accordance with engine characteristics by permitting a discharge of partial fuel quantities, characterized in that said adjustment member at least indirectly controls a discharge opening of a diversion channel leading from said high pressure side of said adjustment piston to a low pressure side and being opened substantially at full load and further including a second discharge valve which is provided in said diversion channel downstream of said discharge opening which is controllable independent of any further engine characteristics.

4,359,995

FUEL INJECTION PUMPING APPARATUS

Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 17, 1980, Ser. No. 217,466

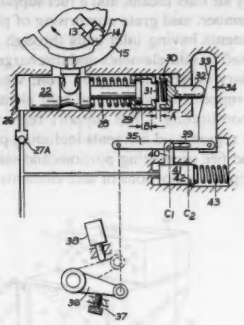
Claims priority, application United Kingdom, Jan. 29, 1980, 8003015

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—502 **4 Claims**

1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and of the kind comprising an injection pump operable in use, to deliver fuel in timed relationship to an engine, a fuel supply pump for delivering fuel to the injection pump, valve means for controlling the output pressure of the fuel pump so that it varies in accordance with the speed at which the apparatus is driven, means for varying the amount of fuel delivery by the injection pump, a piston responsive to the output pressure of the supply pump and movable in response to pressure variation to vary the timing of fuel delivered by the injection pump, resilient means for opposing the movement of the piston, an abutment for said resilient means, a cam plate movable to vary the position of said abutment, a pivotal lever connecting said cam plate with a link the

setting of which varies in accordance with the amount of fuel delivered by the injection pump, an adjustable fulcrum for said pivotal lever and speed responsive means for adjusting the



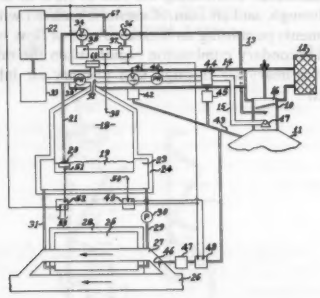
setting of said fulcrum including a further piston operably connected to said fulcrum, said further piston being responsive to the output pressure of said supply pump and further resilient means biasing said further piston.

4,359,996

SYSTEM FOR PREPARING HOT VAPORIZED FUEL FOR USE IN INTERNAL COMBUSTION ENGINE

James C. Kirkland, Jr., 7102 Pearl St., Jacksonville, Fla. 32208, assignor to James C. Kirkland, Jr., Jacksonville, Fla.

Filed Feb. 27, 1980, Ser. No. 125,194
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **13 Claims**



1. A system for vaporizing fuel and controlling the proportioning of it with liquid fuel as feed to a carburetor in an internal combustion engine comprising:

(1) a vapor generator having a vapor space above a liquid fuel space;

(2) a jacket around said liquid fuel space filled with a liquid heating medium;

(3) means for controlled heating of said liquid heating medium by heat exchange with the exhaust of said internal combustion engine;

(4) first temperature sensing means in said vapor space connected to means for introducing liquid fuel into said vapor generator when said temperature reaches a preset valve and also connected to means for correspondingly reducing the amount of liquid fuel admitted to the carburetor of said engine;

(5) first pressure regulator means in the vapor outlet of said vapor generator to direct vaporized fuel to said carburetor upon reaching a preset pressure;

(6) second pressure regulator means in the vapor outlet of said vapor generator to direct vaporized fuel upon reaching a preset pressure to a condenser for liquefying said vaporized fuel and conducting it to the storage tank of said engine;

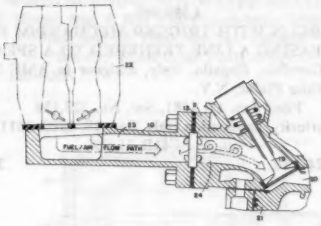
(7) second temperature sensing means in said jacket connected to means for controlling the amount of heat from said exhaust to be exchanged with said liquid heating medium.

4,359,997

FIXED BLADE TURBULENCE GENERATOR

Norbert G. Lyssy, Utopia, Tex., assignor to Harry D. Vaughn, Vanderpool, Tex.

Filed Dec. 24, 1980, Ser. No. 219,969
Int. Cl.³ F02M *29/02*
U.S. Cl. 123—592 **10 Claims**



1. A device for improving fuel/air mixing in an internal combustion engine comprising:

at least two helically twisted blades positioned in an inner bore of an intake port opening, said helically twisted blades being attached to the inner circumference of an opening in an intermediate member operatively dispositioned between an engine intake manifold and an intake port, said helically twisted blades extending into a portion of an intake manifold passage and also extending into a portion of an intake port passage;

said helically twisted blades angled between 30° and 60° in relation to a fuel/air flow path through said inner bore and said intermediate member;

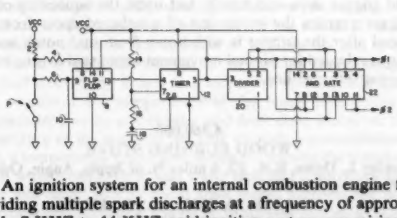
said helically twisted blades having leading edges at an angle greater than 20°, but less than 60° to trailing edges of said helically twisted blades.

4,359,998

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Eugene F. Topic, 530-3130-66 Ave. S.W., Calgary, Alberta, Canada (T3E 5K8)

Filed Nov. 28, 1979, Ser. No. 97,973
Int. Cl.³ F02P *3/04*
U.S. Cl. 123—606 **1 Claim**



1. An ignition system for an internal combustion engine for providing multiple spark discharges at a frequency of approximately 7 KHZ to 14 KHZ, said ignition system comprising:

an electronic breaker point contact debounce circuit including breaker points and a solid state flip flop device,

a solid state audio frequency astable multivibrator connected

to and receiving enabling signals from said debounce circuit and generating a first output signal of a frequency of 14 KHZ to 28 KHZ.

a divide-by-two frequency divider for receiving the output signal from said multivibrator and generating a pair of second output signals.

a pair of AND gates, each receiving one of said second output signals and said first output signal and generating third and fourth complementary outputs respectively,

first and second two-stage current amplifier circuits for receiving said third and fourth complementary outputs respectively,

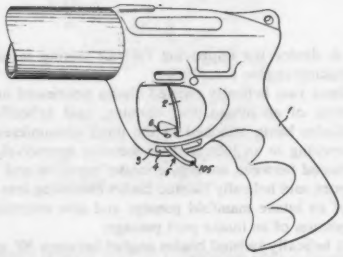
a step-up transformer having a secondary winding and a center-tapped primary winding, said primary winding being fed at opposite ends by said first and second amplifier circuits for producing a high voltage sine wave output of a frequency of 7 KHZ to 14 KHZ across said secondary winding to said engine.

4,359,999

SPEARGUN WITH TRIGGER MECHANISM FOR RELEASING A LINE TETHERED TO A SPEAR

Giovanni Garofalo, Rapallo, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 15, 1981, Ser. No. 225,154
Claims priority, application Italy, Jan. 18, 1980, 15111/80[U]
Int. Cl.³ F41B *15/00*
U.S. Cl. 124—80 **3 Claims**



1. In an underwater speargun comprising a barrel which is adapted to have a line tethered spear projected therefrom, said barrel having at one end thereof a pistol grip with a trigger guard and a spring biased trigger in said guard, means for connecting a spear tethering line to said pistol grip, a spear tethering means for holding said line taut and releasing the same upon squeezing of said trigger, said line holding and releasing means comprising a dog pivoted at its central portion on said guard about a vertical axis positioned in front of said trigger and said dog being positioned in a plane that is transverse to said axis, said central portion having a notch formed therein which faces and receives said trigger therein, one end of said dog projecting laterally beyond said guard and being adapted to have a spear tethering line looped thereon when said trigger is in said notch, and upon the squeezing of said trigger permits the projection of a tethered spear from said barrel after the tripper is withdrawn from said notch and the dog is released for pivotal movement about said axis to release a spear tethered line.

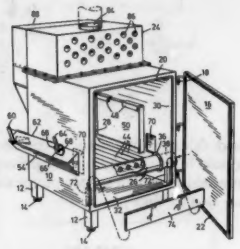
4,360,000

WOOD BURNING STOVE

Stanley L. Down, R.R. #3, 4 miles N. of Appin, Appin, Ontario, Canada (N0L 1A0)

Filed Feb. 20, 1980, Ser. No. 122,954
Int. Cl.³ F24C *1/14*
U.S. Cl. 126—77 **9 Claims**

1. A wood burning stove comprising a fire chamber having a primary combustion region and a secondary combustion region, primary air inlet means for admitting primary air to the primary combustion region of said chamber, air control means for controlling the rate of admission of primary air through said primary air inlet means, and a fuel supporting grate within said fire chamber, said grate comprising of plurality of hollow tubular elements having inlet ends through which secondary air is admitted to said elements and discharge ends disposed at said secondary combustion region from which secondary air issues, fire supporting portions of said elements intermediate said ends constituting a fire support region at said primary combustion region, said elements including portions extending between said fire supporting portions and said discharge ends, said fire supporting portions of said elements constituting heat



exchanger means for heating secondary air within said tubular elements, said discharge ends being disposed so that secondary air preheated in said fire supporting portions of said elements by combustion at said primary combustion region, issues from said discharge ends into said secondary combustion region to co-mingle with the gasses from the fire to promote combustion of said gasses, and air control means associated with said tubular elements for controlling the rate of flow of secondary air therethrough, said air control means associated with said tubular elements permitting an increased rate of flow of secondary to said secondary combustion region when the rate of admission of primary air through said primary air inlet means is reduced.

4,360,001

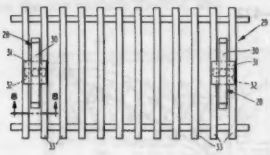
FIRE ARRAY AND APPARATUS

E. Arthur Thompson, P.O. Box 456, Penllyn, Pa. 19422

Continuation-in-part of Ser. No. 27,620, Apr. 6, 1979, Pat. No. 4,271,817. This application Jun. 5, 1981, Ser. No. 270,923
Int. Cl.³ F23B *13/00*
U.S. Cl. 126—164 **1 Claim**

1. Fireplace apparatus including in combination a fire resistant metal grate having a plurality of parallel spaced apart bars and a pair of fireplace implements moveably engaging the grate at two spaced apart portions thereof, each implement comprising a fire resistant metal structure consisting of a V-shaped portion, a substantially flat base plate portion and a T-shaped portion, the V-shaped portion being rigidly affixed normally to one side of the base plate portion ad the T-shaped portion being rigidly affixed to the opposite side of the base plate portion so as to depend therefrom, whereby the top of the T-shape is spaced apart from the base plate portion, the plane of the V-shaped portion and the plane of the T-shaped portion being set relative to each other at about 90 degrees, and each

member of the pair having its V-shaped portion oriented parallel to the parallel spaced apart bars, thereby causing the base



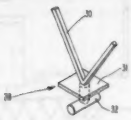


plate portion and T-shaped portion to loosely engage two adjacent parallel bars in a log supporting manner.

4,360,002

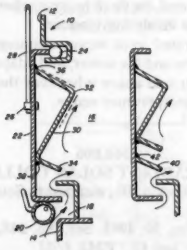
LOG-BURNING STOVE

James R. Choate, P.O. Box 2409, Sampson Rd., Rochester, N.H. 03867

Continuation-in-part of Ser. No. 962,042, Nov. 20, 1978, Pat. No. 4,240,399, which is a continuation-in-part of Ser. No. 789,517, Apr. 21, 1977, Pat. No. 4,131,104. This application Dec. 18, 1980, Ser. No. 217,841

Int. Cl.³ F23M *7/00*

U.S. Cl. 126—190 **8 Claims**



1. A log-burning stove which comprises:

(a) a shell defining a combustion chamber for the combustion of logs;

(b) a flue for the discharge of gaseous combustion products derived from combustion of the logs in the combustion chamber;

(c) an entrance in one wall of the shell and into the combustion chamber for the introduction of logs;

(d) a stove door having a top and a bottom portion and adapted to be placed in an open and a closed position, and which door, in the closed, upright position, seals the entrance, and, in the open position, extends generally laterally outwardly from the lower bottom edge of the entrance;

(e) means to provide for the movement of the door between an open and a closed position; and

(f) a metal baffle element composed of an integral piece of metal extending generally and substantially the length and width of the stove door, the baffle element having a generally cross-sectional shape of the letter Z and composed of upper and lower generally parallel rib elements and an intermediate angular section having generally flat surface, the baffle element secured to the interior of the stove door, so that the surface of the intermediate angular section of the Z-shaped baffle element extends away from and inwardly into the combustion chamber at the top portion of the stove door, when the stove door is in a closed position, whereby the baffle element protects the upper portion of the stove door from excessive heat, and hot combustion gases moving upwardly along the angular section of the baffle element are directed inwardly toward the combustion chamber, and whereby the baffle provides a supporting surface for the positioning and introducing of logs into the combustion chamber.

4,360,003

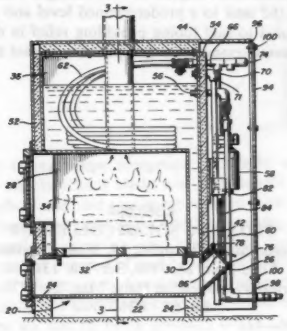
WOOD BURNING HOT WATER HEATER

Willie J. Hardy, Rte. 4, Box 156, Philadelphia, Miss. 39350

Filed Sep. 25, 1980, Ser. No. 190,832

Int. Cl.³ F24B *9/00*; F24D *3/00*

U.S. Cl. 126—368 **3 Claims**



1. A heating system for providing hot water in a home heating system and hot water for a domestic water system comprising a base, a combustion chamber placed above said base and capable of burning wood fuel, said base including an ash bin in communication with said combustion chamber for receiving ashes from spent fuel and including an opening means to allow air to enter through said bin and pass into said combustion chamber, a water tank having an outlet under a predetermined water level of the tank coupled to a home heating system and an inlet coupled to said home heating system for return of water to the tank, the tank substantially enclosing said combustion chamber, an exhaust gas flue communicating with the interior of said combustion chamber and passing through said water tank and into the atmosphere, a door for said combustion chamber to allow filling of said combustion chamber with wood fuel, a bottom door at one end of said ash bin for removal of ashes therefrom, a draft door for said opening means at another end of said ash bin and being movable to control the amount of air flowing therethrough, said draft door being linked to a motor for opening said draft door whenever the temperature of the water falls below a predetermined value and closing said draft door whenever the temperature of the water in the tank exceeds a predetermined value, a temperature responsive means for sensing the temperature of water contained in said water tank and controlling said motor and draft door, a metal shell means surrounding said water tank and including a layer of insulation therein to minimize heat loss from said water tank, tubing including an inlet coupled to a water supply and an outlet coupled to said domestic water system for circulation of water through the tubing and into the domestic water system and positioned in said

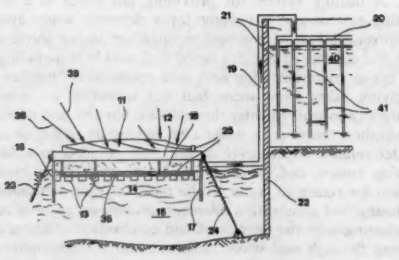
water tank in encircling relation to the exhaust gas flue for heating cool water passing therethrough by heat exchange with water contained in said water tank and for supplying hot water to the domestic water system, said combustion chamber being a unitary component of said water tank positioned on an inwardly directed rim formed on said ash bin, means automatically controlling the flow of heated water from said water tank through said home heating system and return to said tank in response to the demand of the home heating system and the temperature of the water in the tank, said flow controlling means including temperature sensing means for sensing the temperature of water in said water tank, said temperature sensing means being electrically connected to a home heating system thermostat, a relay electrically connected to said temperature sensing means and said home thermostat, a pump for pumping water from the water tank through the home heating system, said pump being electrically connected to said relay, whereby the pump is operable only when the temperature of water in said water tank reaches a predetermined value and said home thermostat calls for heat, vacuum breaker means coupled to said inlet for said tubing preventing siphoning of tank water into the domestic water system, float valve controlled outlet means coupled to said tubing within the water tank to fill the tank to a predetermined level and relief valve means coupled to said tubing providing relief in the event of excessive water temperature and pressure in said tubing.

4,360,004

FLOATING SOLAR COLLECTOR

Giovanni Testolini, via Testolini, 14, Meano (Belluno), Italy

Filed Mar. 18, 1980, Ser. No. 131,364
Claims priority, application Italy, Mar. 29, 1979, 2502 A/79
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—415 **16 Claims**



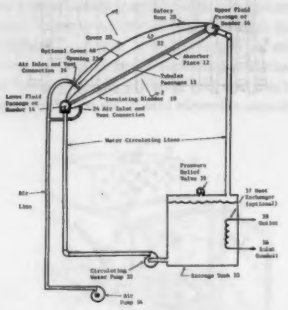
1. An apparatus for receiving, concentrating, accumulating and utilizing solar energy, to be located on a surface of water of a natural or of an artificial water source subject to sun rays, comprising a pontoon placed on the surface of water, said pontoon having an upper surface, a lower surface and vertical sides extending downwards into water; a solar energy collector positioned on said upper surface of the pontoon, said lower surface being spaced from the surface of water so that a cavity is formed between the surface of water and said lower surface and said vertical sides; and a heat exchanger located below the water surface and adapted to produce steam in said cavity, said steam being obtained from the action of thermal energy received by said solar energy collector from sun rays and passed to said heat exchanger which transfers the thermal energy to the layer of water above the heat exchanger.

4,360,005

SOLAR HEAT COLLECTOR SYSTEM

Timothy E. Sharpe, 305 Church St., Lakehurst, N.J. 08733

Filed Jan. 30, 1981, Ser. No. 230,307
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—422 **3 Claims**



3. A solar heat collector system, comprising:

(a) a heat absorber plate having a plurality of passages therein for containing a fluid and at least one flexible inflatable cover sheet transparent to solar radiation covering the solar exposure side of the absorber plate and attached thereto at its periphery;

(b) thermal insulation consisting of an inflatable bladder attached to the rear side of the absorber plate;

(c) tank means for retaining a volume of heat absorbing fluid at least equal to that contained in the plate passages and connected to the absorber plate passages by conduit means sloping continually upward, so that the heated liquid automatically flows upwardly from the plate outlet to the tank and the cooler liquid flows downwardly from the tank to the inlet (lower header) of the plate;

(d) connection means adapted for inflating the space between the plate and the flexible cover sheet, and for inflating the rear side insulating bladder;

(e) thermally-operated vent means connected to the space between the plate and the cover, and adapted to open so as to vent gas from said space whenever the plate reaches a predetermined temperature range.

4,360,006

ENERGY RADIANT SOLAR COLLECTOR

Stuart E. Warnock, Rankin, Ill., assignor to Solar Search Corporation, Rankin, Ill.

Filed Mar. 30, 1981, Ser. No. 248,715
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—449 **2 Claims**

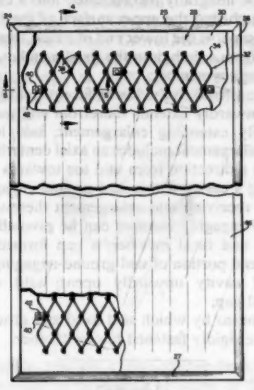
1. A radiant solar energy collector comprising, in combination:

a box-like enclosure including a bottom wall, side walls and a cover transparent to radiate energy, said enclosure forming an essentially sealed conduit through which a heat exchange fluid is caused to flow;

insulation on said bottom wall;

an energy receiving surface disposed within said enclosure in spaced relationship from said bottom wall and said insulation on said bottom wall, said energy receiving surface comprising a base plate and an absorber comprising a plurality of aluminum strips, said aluminum strips being notched in spaced relationship along the lengths thereof and affixed together to form individual absorber elements of a semi-elliptical shape by bending said strips and securing associated ones of said strips together by reversely folding the notched material thereof against said associated ones of said strips, whereby an absorber having

a plurality of individual absorber elements in a honeycomb-like design is provided;
said energy receiving surface being coated with a dull black coat to promote absorption of solar radiant energy;
said absorber being affixed to said base plate 0.1875 inches above the top surface thereof; and



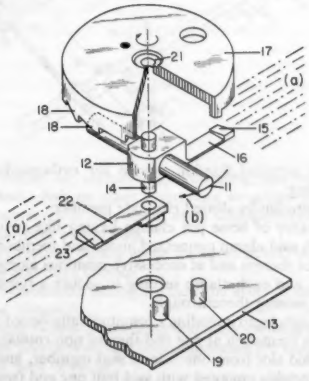
wherein said aluminum strips are 0.016 inches in thickness and are 1.4 inches in height, each of said individual semi-elliptical absorber elements having dimensions of 2.5 inches by 4.25 inches.

4,360,007

REMOTE CONTROLLED MAGNETIC ACTUATOR PARTICULARLY FOR AN IMPLANTABLE DEVICE LIKE A VALVE

Itshak Levy, Ramat Gan; Samuel Ron, Ramat Hasharon; Abraham Sahar, Jerusalem, and Jehoshua Wolowelsky, Ramat Gan, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Aug. 5, 1980, Ser. No. 175,499
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—1 R **7 Claims**



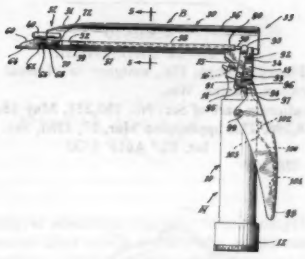
1. An actuator device comprising a housing in which there is arranged a permanent magnet extending at 90° from an axially supported member, said member being attached to a driving pawl via a springy leaf, the movement of said magnet being limited by two stop members attached to the bottom plate of the housing, a ratchet wheel with a plurality of teeth pointing downwards and adapted to be engaged by said pawl, another pawl attached to a springy member rigidly attached to said housing, the pawl being adapted to stop a reverse movement of the ratchet wheel, the arrangement being such that application of a magnetic field of adequate strength from a certain distance results in the movement of the magnet and the pawl attached thereto to or fro within the range defined by the stop members, each such movement resulting in the stepwise advance of the ratchet wheel by one tooth.

4,360,008

LARYNGOSCOPE

Frank G. Corazzelli, Jr., 60 Canterbury La., Trumbull, Conn. 06611

Filed Sep. 2, 1980, Ser. No. 183,263
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—11 **10 Claims**



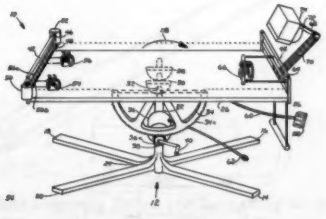
1. A laryngoscope comprising a handle and a laryngeal blade; said laryngeal blade and said handle each having a longitudinal axis, said axes being oriented relative to each other at substantially a right angle; said blade having a distal end and a proximal end relative to said handle; said proximal end being connected to one end of said handle; said blade being configured and adapted to be inserted into a patient's oral cavity by manipulation of said handle; said distal blade end comprising a separate tip; said tip being pivotally connected to the remainder of said blade; said tip being adapted to engage and depress the epiglottis of a patient in order to permit viewing of the larynx and permit intubation; and means disposed off of the axis of said blade and accessible at said handle for selectively manually pivoting said tip.

4,360,009

MEDICAL TREATMENT TABLE

Eric Weisman, 2092 E. 11th Ave., North St. Paul, Minn. 55109

Filed Jul. 7, 1980, Ser. No. 166,247
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—71 **10 Claims**



1. Medical treatment table for treating predetermined medical conditions, comprising:
a. table including end frame supports and two centered pivot mounts;

b. half circumferential ring gear adjacent to one of said pivot mounts on the bottom of said table;

c. pedestal base including an upward extending pedestal, four pods extending angularly outward from said pedestal, and a pivot pin extending through a top portion of said pedestal and through said pivot mounts;

d. motor drive means including a sprocket at a base of said pedestal and engaged to said ring gear for angularly tilting said table;

e. control means for switching power to said motor means where said motor tilts said table for treating a patient; and,

f. second motor means on each end of one of said end frames, pulleys anchored at each end of said second motor means, and an ankle-leg harness means connected to an endless loop about said pulleys whereby said motor means varies positioning of said endless loops about said pulley thereby varying distance of said ankle-leg harness with respect to each other.

4,360,010

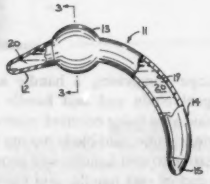
PENILE PROSTHESIS

Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation-in-part of Ser. No. 150,231, May 15, 1980, Pat. No. 4,318,396. This application Mar. 17, 1981, Ser. No. 244,335

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—79 **5 Claims**



1. A penile implant comprising a flexible, elongated member having a relatively short, hollow, proximal stem, said stem having a wall portion which is relatively stiff so as to support and anchor the implant and a reservoir for inflating fluid; an elongated flexible distal portion having a non-distensible, pressurizable chamber and a tip and pump means located within said elongated member between the reservoir in the hollow stem and the pressurizable chamber for transferring fluid from the reservoir to the non-distensible chamber.

4,360,011

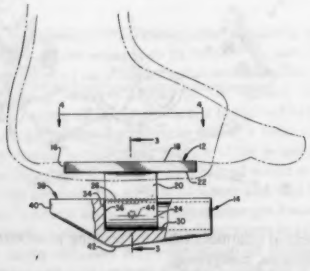
ADJUSTABLE WALKING IRON FOR LEG CASTS

Royce C. Lewis, Jr., 5233 W. 19th St., Lubbock, Tex. 79407

Filed Oct. 6, 1980, Ser. No. 194,567

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—83.5 **7 Claims**



1. A walking iron for use in conjunction with a cast applied to one's lower extremity, such as ones foot, comprising: a cast-engaging fixed member; a ground-engaging member;

said ground-engaging member includes a main body having opposed sides, a toe end, a heel end, a lowermost ground-engaging surface, and an uppermost end portion;

said fixed member includes an upper and a lower face and which can be integrally incorporated into a cast applied to one's foot such that the upper surface of the fixed member can bottom support the lower end of a cast, thereby transferring a load from a limb, into the fixed member, and into the ground-engaging member;

a web member affixed to the lower face of said fixed member which downwardly extends therefrom and terminates in a longitudinally extending enlargement; said longitudinally extending enlargement includes an axial centerline extending generally in a direction from said toe towards said heel;

means forming a cavity within said ground-engaging member for slidably receiving said enlargement therewithin, so that said ground-engaging member can be pivotally moved respective to said fixed member; a gap formed within said uppermost end portion of said ground-engaging member by which said cavity upwardly opens; said web extends through said gap;

and fastener means by which said fixed and ground-engaging members are rigidly fastened to one another.

4,360,012

EXTERNAL FIXATION DEVICES FOR ORTHOPAEDIC FRACTURES

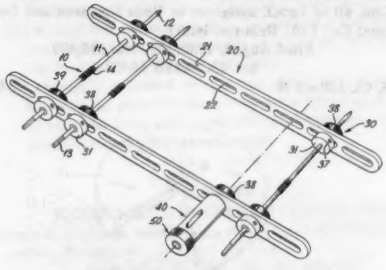
John C. McHarrie, Preston, and Peter W. Hopcroft, Liverpool, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 18, 1981, Ser. No. 235,723

Claims priority, application United Kingdom, Feb. 19, 1980, 8005579

Int. Cl.³ A61F *5/04;* A61B *17/18*

U.S. Cl. 128—92 EB **3 Claims**



1. An external fixation device for orthopaedic fractures comprising:

a longitudinally-slotted elongate member;

a plurality of bone pin clamps having like two-part form, each said clamp connected about said member by way of a slot therein and at successive positions along said member, and each clamp serving to secure a respective bone pin passing therethrough;

each said clamp including a longitudinally-bored bolt having a rib formation at one end thereof non-rotatably engaged in said slot from one side of said member, and a first nut threadably engaged with said bolt one end from the other side of said member;

and a single drill guide successively interchangeable with each of said clamp bolts to align the respective bone pins in parallel manner in predetermined relation with said member;

said guide including an axially split bush formed of two halves having respective cooperable detent and indent formations engaged to register the halves, said bush being

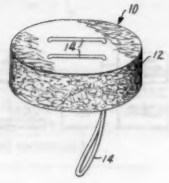
externally threaded at one end for successive engagement with each said clamp first nut and having a rib formation at said one end of said bush for non-rotatable engagement in said slot, and a second nut threadedly engaged around said bush other end.

4,360,013

POLYMERIC ACID CONTRACEPTIVE DEVICES

Thomas H. Barrows, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 21, 1980, Ser. No. 142,239
Int. Cl.³ C08J 9/16; A61F 5/46; B01D 47/16; B32B 5/18
U.S. Cl. 128—130 **17 Claims**



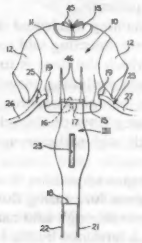
1. A disposable, resilient contraceptive device for insertion into the upper vault of the vagina proximal to the cervix comprising a cylindrical, absorbent non-woven sponge of alginic acid or related polysaccharide fibers bearing carboxylic acid functionality in an effective spermicidal quantity and a retrieval means.

4,360,014

RESTRAINING GARMENT

Virginia M. Manahan, 4421 Browning Dr., Oxnard, Calif. 93030

Filed Nov. 24, 1980, Ser. No. 209,850
Int. Cl.³ A61F 13/00
U.S. Cl. 128—134 **7 Claims**



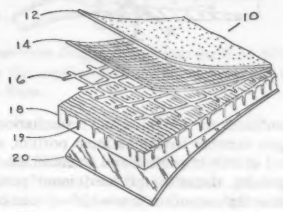
1. A garment for comfortably confining and securing a person to bed, chair or other supporting structure while permitting relatively free movement upon said supporting structure, said garment comprising:
(a) a body member fitting about the torso of said person and having apertures therein;
(b) sleeve members, through which the arms of said person may be disposed;
(c) fastening means for securing said body member about the torso of said person, said fastening means for snugly forming the neck opening;
(d) a single belt means disposed through said apertures in said body member, positioned such that said single belt means is disposed at the waist of said person, said belt means capable of being coupled to said supporting structure on either side of said person for confining said person to said supporting structure while permitting relative freedom of movement upon said supporting structure, said belt means being separate and not coupled to said body member permitting independent adjustment of said body member;
(e) a strap means coupled to the front lower portion of said body member, said strap means capable of being disposed through the crotch of said person and being secured behind the buttock of said person to a said supporting structure or to a lower portion at the rear of said body member.

4,360,015

MULTILAYER ABSORBENT STRUCTURE

Nathan Mayer, East Brunswick, N.J., assignor to Hartford Corporation, New Brunswick, N.J.

Filed May 14, 1981, Ser. No. 263,685
Int. Cl.³ A61L 15/00
U.S. Cl. 128—156 **16 Claims**



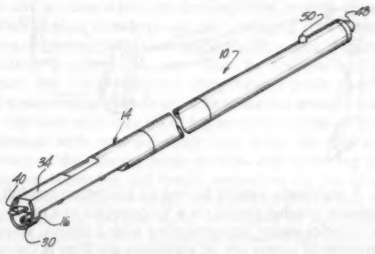
1. A multilayer absorbent structure, which comprises:
(a) an exterior layer which contacts the wound surface;
(b) an absorbent cellulosic layer joined to the exterior layer;
(c) a nonabsorbent grid material which is joined on one side to the absorbent cellulosic layer and on the other side to a flexible absorbent member;
(d) said flexible absorbent member formed of a flexible sheet of sponge material containing a web of absorbent fibers disposed on the flexible sheet and extending into the flexible sheet without extending through the flexible sheet;
(e) a moisture resistant barrier layer making an outer layer which is joined to the lower side of the sponge material portion of the flexible absorbent member.

4,360,016

BLOOD COLLECTING DEVICE

Robert J. Sarrine, Ann Arbor, Mich., assignor to Transidyne General Corp., Ann Arbor, Mich.

Filed Jul. 1, 1980, Ser. No. 165,155
Int. Cl.³ A61B 10/00
U.S. Cl. 128—763 **17 Claims**



1. A fluid collecting device (**10**) comprising an elongated member (**14**), puncturing means (**40**) carried by said member for puncturing tissue, and means (**32**) also carried by said member (**14**) for connecting a capillary tube (**30**) to the member such that an end (**31**) of the capillary tube is maintained in a predetermined space relationship with said puncturing means

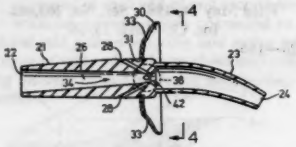
whereby the tube end is automatically positioned adjacent to the punctured tissue for collecting blood issuing therefrom.

4,360,017

MOUTHPIECE FOR RESUSCITATION

Harry Barlett, 500 Green Rd., No. 803, Stoney Creek, Ontario, Canada (L8E 3M6)

Filed Mar. 18, 1981, Ser. No. 244,865
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—202.28 **15 Claims**



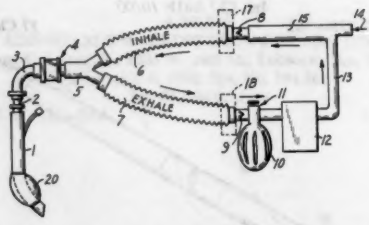
1. An insufflator for administering resuscitation comprising:
an elongate member having an input portion, a central portion and an output portion and a central axial air passageway passing therethrough; said input portion defining input mouthpiece means into which air can be blown by a person administering the resuscitation, said output portion defining output mouthpiece means insertable into the mouth of a recipient; the air passageway having a venturi in said central portion; the air passageway in the input portion decreasing in cross-sectional area toward the venturi; the elongate member defining at least one fresh port communicating with the throat of said venturi; and the air passageway in the input portion and venturi being dimensioned to produce a venturi effect when air is blown into the input portion to draw ambient air through the fresh air ports into the air passageway.

4,360,018

ANESTHESIA SYSTEM AND METHOD OF FILTERING RESPIRATORY GAS

Pradip V. Choksi, Northridge, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 20, 1979, Ser. No. 105,841
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—205.12 **4 Claims**



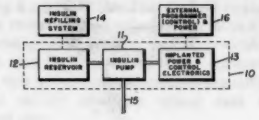
1. A anesthesia system having an inhalation conduit and an exhalation conduit joined via a Y-connector to a common duct that includes means for connecting with a patient, wherein the improvement comprises: an anesthesia gas filter in the common duct having a filtration efficiency in excess of 95%, said filter comprising a housing body having an internal volume of 50 cc or less; a pleated hydrophobic filter element sealed in said housing body having a pressure drop of less than 0.3 inch of water at gas flow rates up to 12.5 L gas/minute; and connectors, for attaching said filter between the Y-connector and the common duct, attached at opposite ends of said housing body to form a passage through which respiratory gas can be driven through said filter by normal breathing of the patient.

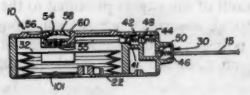
4,360,019

IMPLANTABLE INFUSION DEVICE

Peer M. Portner, Kensington, and Jal S. Jassawalla, San Francisco, both of Calif., assignors to Andros Incorporated, Berkeley, Calif.

Continuation-in-part of Ser. No. 15,927, Feb. 28, 1979, Pat. No. 4,265,241. This application Mar. 31, 1980, Ser. No. 135,219
Int. Cl.³ A61M *7/00*
U.S. Cl. 128—213 R **30 Claims**





1. An implantable drug infusion device for delivering precisely regulated dosages of drugs into the body of a patient, comprising
a housing for the infusion device which is implantable within the body of the patient,
a reservoir for containing a selected drug,
cathether means for connecting said reservoir with a portion of the body to which the drug is to be delivered,
first actuating means including power means and control means internally contained within said infusion device housing for causing flow of the selected drug from said reservoir through said catheter means at a first dosage rate, and
second actuating means responsive to non-invasive extracorporeal control means for causing flow of the selected drug from said reservoir through said catheter means at a second dosage rate determined by the extracorporeal control means, said second actuating means including means contained within said housing for receiving power from the extracorporeal control means through intact skin.

4,360,020

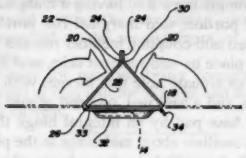
DISPOSABLE SWAB

James R. Hitchcock, Jr., and Charles J. Nevens, both of Barrington, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 150,011, May 15, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 216,037
Int. Cl.³ A61M *35/00*
U.S. Cl. 128—269 **23 Claims**

1. A disposable swab which comprises:
a flat, sheet-like generally stiff strip; a pad member centrally attached to at least one side of said strip; an inner pair of fold lines transversely positioned in said strip, each fold line of said inner pair being positioned on opposite sides of and positioned adjacent an opposite end of said pad member by generally equal distances, to permit opposed, termi-

nal portions of said strip to be folded rearwardly relative to said pad; and an outer pair of fold lines transversely positioned in said strip, each fold line of said outer pair being positioned adjacent opposite ends of said strip and spaced by generally equal distances to permit end portions

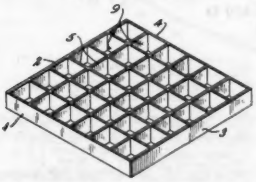


of rearwardly folded terminal portions to be pinched by the fingers together into flat, abutting relation, whereby said strip can form a structure which is generally triangular in cross section, the base of said triangular cross section carrying said pad member.

4,360,021
ABSORBENT ARTICLE

Joseph F. Stima, Edison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 6, 1981, Ser. No. 260,967
Int. Cl.³ A61F *13/16*
U.S. Cl. 128—287 **14 Claims**



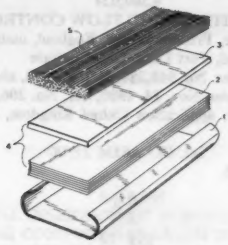
1. An absorbent article comprising a liquid pervious backing sheet having deposited thereon a plurality of substantially uniformly distributed discrete portions of absorbent material, each of said absorber portions being substantially identical in cross section and separated from adjacent of said absorber portions by a base sheet portion having a width W, a cover sheet bonded to said base sheet uniformly along a width portion W_1 substantially symetrically disposed within said width W, the ratio of $W:W_1$ being from about 1.5:1 to 10:1, said base and cover sheets so bonded defining a plurality of pocket portions encasing each of said absorber portions within a volume exceeding that occupied by each of said absorber portions thereby enabling the latter to swell when wet.

4,360,022
SANITARY NAPKIN

Akira Usami, Sakai; Motoharu Kotani, Kawachinagano, and Tomoko Goda, Kochi, all of Japan, assignors to Daisel Kagaku Kogyo Kabushikikaisha, Osaka and Fuji Eizai Kabushikikaisha, Kochi, both of, Japan

Filed Dec. 31, 1980, Ser. No. 221,669
Claims priority, application Japan, Jan. 17, 1980, 55-3094[U]
Int. Cl.³ A61F *13/16*
U.S. Cl. 128—290 R **16 Claims**

1. A sanitary napkin comprising an elongated filler which in turn comprises a water-permeable layer formed of hydrophobic fibers and an absorbing layer underlying said water-permeable layer, and a water-permeable covering which covers said filler, said water-permeable layer of hydrophobic fiber comprising rows of hydrophobic fibers arranged in strip-like bundles of elongated fibers disposed generally parallel to the length of said sanitary napkin, whereby the fluid diffuses along the fibers a greater amount in a longitudinal direction as com-

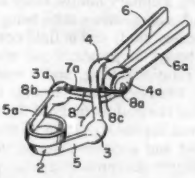


pared to a transverse direction such that the fluid diffuses along the napkin by the capillarity of the fibers to spread in a generally elliptical form.

4,360,023
CEREBRAL ANEURYSM CLIP

Keiichiro Sugita, Nagoya, and Gunji Nemoto, Matsudo, both of Japan, assignors to Mizuho Ika Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,198
Claims priority, application Japan, Aug. 17, 1976, 51-110146[U]
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 **4 Claims**



2. A cerebral aneurysm clip comprising a coiled intermediate part and a pair of arms integrally extending therefrom, said arms including, respectively, open arm sections forming extensions of the coiled part, cross arm sections forming extensions of the open arm sections and which extend in mutually crossing and slidably engaging relationship, and have mutually opposed side surfaces which are formed flat to provide smooth face-to-face contact therebetween, and clamping jaws forming extensions of the cross arm sections and being urged in face-to-face abutting contact with each other by resiliency of the coiled part, and the clip further comprising a guide member made of metal wire and made up of an elongated straight guide portion and two relatively short leg portions which are integrally formed with, and angularly bent from, the two ends respectively of the straight guide portion, one of the leg portions being embedded in and fixedly secured to the jaw of one arm at a position adjacent to the cross arm section of said one arm, the other leg portion being embedded in and fixedly secured to said one arm at a position between the open arm section of said one arm and the cross arm section thereof, and said straight guide portion lying in a plane spaced from and substantially parallel to the flat side surface of the cross arm section of said one arm, the cross arm section of the other arm of said pair lying between the cross arm section of said one arm and the straight guide portion of said guide member and being in sliding contact with said straight guide portion, whereby the straight guide portion applies force to the cross arm section of

said other arm to urge it into contact with the cross arm section of said one arm.

4,360,024

CATHETER WITH LIQUID FLOW CONTROL MEANS

Henry G. Wallace, Frinton-on-Sea, England, assignor to H. G. Wallace Limited, Port Lane, Great Britain

Continuation of Ser. No. 948,384, Oct. 4, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 206,973

Claims priority, application United Kingdom, Oct. 7, 1977, 41874/77

Int. Cl.³ A61M 25/00

U.S. Cl. 604—256 1 Claim

1. In a catheter assembly comprising a flexible catheter tube having an axial bore, a unitary hollow body having a distal end and a proximal end, said catheter tube being inserted into the distal end of said hollow body and in fluid communication with the hollow of the body, the proximal end of said hollow body forming a female infusion fitting, and a male infusion fitting inserted into said female infusion fitting; the improvement which resides in that the hollow body of the catheter assembly consists of a non-collapsible portion extending rearwardly from the distal end and a collapsible portion with memory immediately adjacent to said non-collapsible portion extending to the proximal end, and has a rigid male infusion fitting of the same length as the collapsible portion removably inserted into the collapsible portion, whereby said hollow body becomes non-collapsible over its entire length.

4,360,025

CATHETER RETAINER

John V. Edwards, East Grinstead, England, assignor to Kingsdown Medical Consultants, Ltd., England

Filed Mar. 11, 1981, Ser. No. 242,776

Claims priority, application United Kingdom, Apr. 1, 1980, 8010860

Int. Cl.³ A61M 25/00

U.S. Cl. 604—180 8 Claims

7. A catheter retainer capable of holding catheters of varying external diameter in position, said retainer comprising an adhesive dressing one surface of which adheres the retainer to the skin, said dressing having a central opening, a coupling member having a flange permanently affixed to the other surface of said dressing around said central opening, said coupling member also having an upstanding rim and a resilient flexible skirt projecting inwardly from the periphery of said rim, and a catheter retainer insert formed from a single piece of plastics material comprising a disc having a marginal rim portion and a central portion, said marginal rim portion dimensioned to fit between said coupling member rim and said dressing and be held in place by said resilient skirt, said disc central portion including an arcuate hole that merges with a catheter slot, a limb section, and a base pad, one end of said limb being connected to said base pad by an integral hinge thereby enabling said limb to oscillate about said hinge in the plane of the disc, the other end of said limb having a hook which cooperates with a series of notches on said base pad, said catheter slot positioned between opposing walls of said limb and said base pad with a series of catheter gripping jaws on these opposing limb and base pad walls.

4,360,026

DEFIBRILLATOR

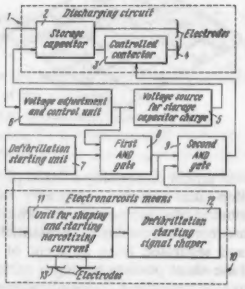
Igor V. Venin, ulitsa Pozharskogo, 2, kv. 9; Oleg L. Gonopolsky, ulitsa Dovbusha, 11, kv. 5; Valery P. Zhuk, ulitsa Ulyanovskaya, 5, kv. 9; Vladimir I. Rodionov, ulitsa Zayachkovskogo, 7, kv. 27; Andrei A. Smerdov, ulitsa Stepana Tudora, 16, kv. 5, and Alexandr G. Tischenko, ulitsa Nechuya-Levitskogo, 15, kv. 5, all of Lvov, U.S.S.R.

Filed Dec. 11, 1980, Ser. No. 215,519

Claims priority, application U.S.S.R., Feb. 28, 1980, 2882806

Int. Cl.³ A61N 1/36

U.S. Cl. 128—419 D 1 Claim



1. A defibrillator comprising:

a. a discharging circuit provided with

a storage capacitor;

a controlled contactor being connected in series to said storage capacitor;

electrodes for defibrillation being connected in series to said storage capacitor and to said controlled contactor;

b. a voltage source for charging said storage capacitor, said voltage source having an input, and an output which output being connected to said storage capacitor;

c. a unit for adjusting and controlling a voltage across said storage capacitor, said unit having an input connected to said storage capacitor, and an output connected to the input of said voltage source;

d. a first AND gate having two inputs and an output, the first input being connected to the output of said unit for adjusting and controlling the voltage;

e. a second AND gate having two inputs and an output, the first input being connected to the output of said first AND gate, while the output thereof is connected to the input of said controlled contactor;

f. a unit for starting defibrillation, connected to the second input of said first AND gate;

g. electronarcosis means comprising:

a unit for shaping and starting a narcotizing current having an input connected to the output of said first AND gate, and two outputs;

a shaper of a signal for starting defibrillation having an input connected to the first output of said unit for shaping and starting the narcotizing current, and an output connected to the second input of said second AND gate;

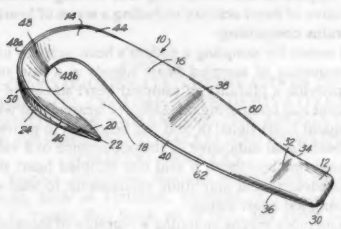
electrodes for narcosis being connected to the second output of said unit for shaping and starting the narcotizing current.

4,360,027

THIN, LIGHT-WEIGHT FLEXIBLE ORTHOPEDIC DEVICE

Bruce Friedlander, 129 Joralemon St., Brooklyn, N.Y. 11201, and Steven E. Samet, 232 Washington Ave., Brooklyn, N.Y. 11205

Filed Jun. 29, 1981, Ser. No. 278,605
Int. Cl.³ A61F *5/14*
U.S. Cl. 128—581 **12 Claims**



1. A light-weight, low profile, anti-pronation orthopedic appliance for correctably supporting a human foot, comprising:

(a) a therapeutic portion having a longitudinal axis extending lengthwise of the foot, said therapeutic portion including a distal forefoot-supporting section, a proximal heel-supporting section spaced longitudinally of the distal section, and a medial arch-supporting section located intermediate of and being of one-piece with the distal and proximal sections,

(i) said distal section lying generally underneath the metatarsal head region at the medial side of the plantar aspect of the foot, and extending laterally of the longitudinal axis across the foot but terminating short of the lateral side of the plantar aspect of the foot,

(ii) said proximal section lying generally underneath the inner heel region at the medial side of the plantar aspect of the foot, and extending laterally of the longitudinal axis across the foot but terminating short of the lateral side of the plantar aspect of the foot,

(iii) said medial arch section lying generally underneath the arch region at the medial side of the plantar aspect of the foot, and extending laterally of the longitudinal axis across the foot but terminating short of the lateral side of the plantar aspect of the foot;

(b) a non-therapeutic portion located laterally of the therapeutic portion and lying generally underneath and longitudinally along the lateral side of the plantar aspect of the foot, said non-therapeutic portion having a lower elevation along its length as compared to the correspondingly higher elevation of the therapeutic portion along its length, to thereby negatively support the lateral side of the plantar aspect of the foot; and

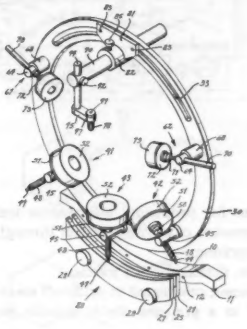
(c) posting means operatively mounted on the therapeutic portion, for raising the elevation of the distal, proximal and medial arch sections at the medial side of the plantar aspect of the foot as compared to the respectively corresponding lower elevations at the lateral side of the plantar aspect of the foot, to thereby correctably support the foot in an anti-pronation manner.

4,360,028

CRANIAL INSERTION OF SURGICAL NEEDLE UTILIZING COMPUTER-ASSISTED TOMOGRAPHY

Jean Y. Barbier, 7532 Warner Ave., St. Louis, Mo. 63117, and Christopher J. Moran, 12559 Amersham Ct., St. Louis, Mo. 63141

Filed Jan. 14, 1980, Ser. No. 111,892
Int. Cl.³ A61B *6/00, 19/00*
U.S. Cl. 128—659 **4 Claims**



1. A method of performing brain surgical procedures through the skull to a point of procedure by utilizing a computer-assisted tomography scanner of the type which develops indexed parallel planar sectional representations of the head, comprising the steps of

securing a patient's head, below the level at which such sectional representations are to be developed, in fixed position relative to the movable, indexable cradle of the scanner,

preliminarily scanning the head and selecting from the sectional representations so developed an indexed plane of interest at which a chosen point of procedure is located,

positioning an instrument holder having a density substantially of the order of that of soft human tissue and having a bore for guiding a surgical instrument with the axis of the bore in the plane of interest,

further positioning the instrument holder angularly in the plane of interest with the axis of its bore along a straight line directed to the point of procedure through a point of entrance into the skull,

scanning at the plane of interest to confirm that the bore of the instrument holder is positioned for guidance of the instrument along the selected line to the point of procedure,

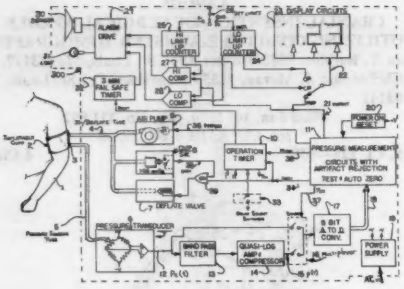
drilling through the skull at the point of entrance guided by the bore of the instrument holder, and

inserting the surgical instrument through the guide-holder bore and the skull point of entrance and guiding same by the instrument holder bore to the point of procedure.

4,360,029
AUTOMATIC MEAN BLOOD PRESSURE READING DEVICE

Maynard Ramsey, III, Tampa, Fla., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 895,061, Apr. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 670,902, Mar. 26, 1976, abandoned. This application Oct. 3, 1980, Ser. No. 193,866
Int. Cl.³ A61B 5/02
U.S. Cl. 128—681 11 Claims



1. Apparatus for producing information indicative of the mean blood pressure of a living subject through indirect measurement comprising:

(a) inflatable, deflatable cuff means;

(b) pump means, connected to said cuff means, for inflating said cuff to a pressure above systolic pressure of said subject;

(c) deflating means, connected to said cuff means, for controlled deflation of said cuff means;

(d) means for measuring cuff pressure and, at a given cuff pressure, pressure pulsations in said cuff means caused by heartbeats of said subject;

(e) control means, responsive to said means for measuring, for initially energizing said pump means to inflate said cuff, and for subsequently energizing said deflating means incrementally to deflate said cuff at predetermined pressure increments;

(f) wherein said measuring means includes:

(i) means for detecting, for each successive set of said pulsations occasioned by successive heartbeats, pulsation amplitude and pulsation time rate of change,

(ii) means for identifying, at each of said cuff pressure increments, the occurrence of at least two successive sets of pulsations which meet predetermined amplitude and time rate of change criteria relative to one another,

(iii) means, responsive to said means for identifying, for energizing said control means to deflate said cuff by an increment upon identification of said occurrence of pulsations within said criteria, and

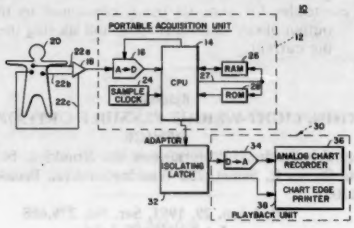
(iv) means, responsive to said means for identifying, for comparing specified peak to peak amplitude factors of identified pulsations at successive cuff pressure increments; and

(g) output means, responsive to said means for comparing, for indicating mean blood pressure as the lowest cuff pressure increment corresponding to the largest of said specified peak-to-peak amplitude factors.

4,360,030
APPARATUS FOR MONITORING AND STORING A VARIETY OF HEART ACTIVITY SIGNALS

Paul Citron, New Brighton; Dennis G. Hepp, Coon Rapids, and Thomas L. Jirak, Plymouth, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 23, 1980, Ser. No. 114,663
Int. Cl.³ A61B 5/04
U.S. Cl. 128—702 17 Claims



1. Apparatus for monitoring and storing electrical signals indicative of heart activity including a series of heartbeats, said apparatus comprising:

(a) means for sampling a patient's heart activity to provide a sequence of sampled heart signals at a rate sufficient to provide a plurality of sampled heart signals of one heartbeat and comparing one sampled heart signal with a subsequent heart signal of said one heartbeat to provide a heartbeat signal indicative of the occurrence of a valid peak of said one heartbeat, if said one sampled heart signal has a predetermined amplitude relationship to said subsequent sampled heart signal;

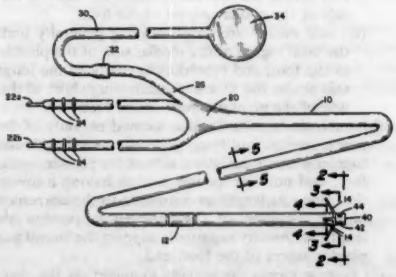
(b) memory means including a plurality of storage locations, said locations for storing corresponding heartbeat signals, and

(c) means responsive to the provision of said heartbeat signal for evaluating a sequence of said heartbeat signals as stored in said plurality of locations to determine whether the patient's activity is rhythmic, and if so for providing a manifestation of rhythmic heart activity and if not, for providing a manifestation of disrhythmic heart activity.

4,360,031
DRUG DISPENSING IRRIGATABLE ELECTRODE

David L. White, Wyoming, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 11, 1980, Ser. No. 186,106
Int. Cl.³ A61N 1/04
U.S. Cl. 128—786 18 Claims



1. An endocardial pacing lead suitable for chronic implantation comprising:

an insulative outer sheath having a proximal end and a distal end;

a first conductor having a proximal end and a distal end fixedly mounted within said outer sheath;

a fluid resistant inner sheath having a proximal end, a distal end, and an interior lumen, fixedly mounted within said outer sheath;

a first electrode electrically coupled to the distal end of said first conductor and fixedly attached to the distal end of said outer sheath, said first electrode having an exterior surface exposed to the exterior of said outer sheath and at least one aperture open to both the exterior surface of said electrode and to the lumen of said inner sheath;

a first electrical connector electrically coupled to the proximal end of said first conductor and fixedly attached to said outer sheath; and

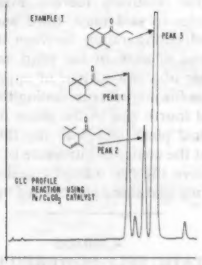
an implantable fluid chamber fixedly attached to the proximal end of said inner sheath and in fluid communication with the lumen of said inner sheath.

4,360,032

USE OF HYDROGENATED DERIVATIVES OF 2,6,6-TRIMETHYL-CYCLOHEXENE DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCO AND SMOKING TOBACCO ARTICLES

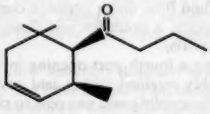
Robert W. Trenkle, Bricktown; Braja D. Mookherjee; Frederick L. Schmitt, both of Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 969,852, Dec. 15, 1978, Pat. No. 4,292,447.
This application Feb. 27, 1981, Ser. No. 239,052
Int. Cl.³ A24B *3/12, 15/30*
U.S. Cl. 131—276 **4 Claims**

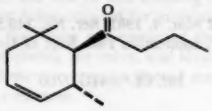


1. The process for augmenting or enhancing the aroma or taste of smoking tobacco comprising the step of intimately admixing with smoking tobacco at least one substance selected from the group consisting of:

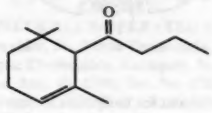
(i) the compound having the structure:

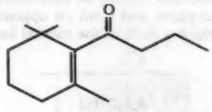


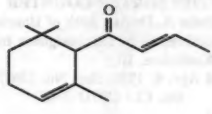
(ii) the compound having the structure:

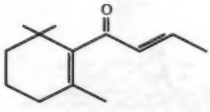


(iii) a mixture of compounds having the structures:

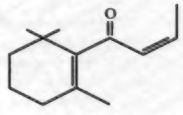






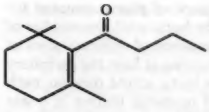


and



and

(iv) a mixture of compounds having the structures:



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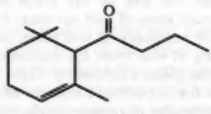

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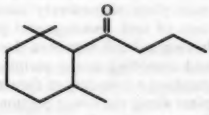


4,360,033

FASTENING ELEMENT FOR HAIRPIECES

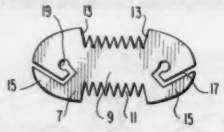
Gerhard Schmehling, Baden-Baden, Fed. Rep. of Germany, assignor to Schmehling GmbH, Baden-Baden, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,551

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008162

Int. Cl.³ A41G *3/00*

U.S. Cl. 132—53 8 Claims



1. A fastening element for hairpieces, comprising a one-piece flat body having recesses therein for detachable securement to a filament of a hairpiece, and teeth on opposite edges of said flat body about which a hank of the natural hair of the wearer can be wound.

4,360,034

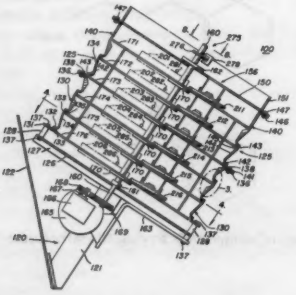
COIN SORTER-COUNTER

Jose E. Davila; Efrain A. Davila, both of Bourbonnais, and Jim H. Gomez, Kankakee, all of Ill., assignors to Joseph C. Gianotti, Trustee, Kankakee, Ill.

Filed Apr. 9, 1980, Ser. No. 138,714

Int. Cl.³ G07D *3/02*

U.S. Cl. 133—3 D 23 Claims



1. A coin sorter comprising a stack of plates mounted for rotation about an axis inclined to the horizontal, the number of plates being at least equal to the number of different sizes of coins to be sorted, a housing surrounding at least the periphery of said plates for keeping the coins being sorted thereon, each of said plates having a plurality of openings therein of a size slightly smaller than the size of the coins to be retained thereon, at least certain ones of said openings being arranged adjacent to the outer periphery of said plate, the openings in said plates increasing in size from the bottommost plate upwardly to the topmost plate, a coin entry chute disposed upon the uppermost plate for depositing a mixture of different sizes of coins thereon, a plurality of recesses in the upper surface of each plate respectively surrounding said certain peripheral ones of said openings and providing coin receiving pockets having a depth less than the thickness of the associated plate and extending to the periphery thereof, each of said recesses catching a coin only of the size to be retained on the associated plate along the lower portion of the path of travel of the plate for supporting the coin on the plate and carrying the coin upwardly and past the highest portion of the path of travel of the plate, a plurality of discharge openings through said housing respectively associated with each of said plates and disposed adjacent to the outer periphery of the associated plate just below the highest portion of the path of travel thereof to receive coins carried by said recesses one-by-one thereinto, and coin ejection means for each of said plates adjacent to said discharge openings for moving coins one-by-one from said recesses beyond the periphery of the associated plate and into the associated discharge opening.

4,360,035

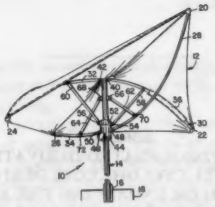
LAWN UMBRELLA

Thomas P. Dillman, Spring City, Tenn., assignor to The Sherwood Corporation, Spring City, Tenn.

Filed Aug. 24, 1981, Ser. No. 295,807

Int. Cl.³ A45B *11/00, 19/00*

U.S. Cl. 135—20 R 6 Claims



1. A lawn umbrella comprising a mast, a flexible shade having a generally quadrilateral configuration disposed above the mast, first and second ribs each having a bowed configuration between its ends, means for fastening one end of each of the first and second ribs to a respective corner of a first pair of opposed corners of the shade, means for pivotably mounting the other end of each of the first and second ribs to the mast adjacent the upper end for pivotable movement in a vertical plane and with the ribs bowed such that the center of curvature of each rib is beneath the shade, a first slider disposed about the mast and slidable relatively thereto, means for selectively locking said slider to said mast, third and fourth ribs each having a bowed configuration between its ends, means for fastening one end of each of the third and fourth ribs to a respective corner of a second pair of opposed corners of the shade, and means for pivotably mounting the other end of each of the third and fourth ribs to the slider for pivotable movement in a vertical plane and with the third and fourth ribs bowed such that the center of curvature of each said third and fourth rib is above the rib, whereby said shade may be collapsed by lowering said slider and opened by raising said slider.

4,360,036

THERMOSTATIC SELF-POWERED DRAIN VALVE

Russell S. Shelton, 9 Park Ave., Flanders, N.J. 07836

Filed Aug. 24, 1981, Ser. No. 269,797

Int. Cl.³ E03B *7/12;* F16K *31/38*

U.S. Cl. 137—61 7 Claims

5. A fluid containing system protected against extreme temperatures comprising a body having a cavity therein and three ports opening into said cavity,

said protected system being connected to one of said ports, a source of fluid flow under pressure connected to a second of said ports, a drain for said fluids connected to a third of said ports,

said body having a fourth port opening into said cavity,

a barrier slideably retained within said cavity and adapted for selectively coupling said one port to either said second port or said third port,

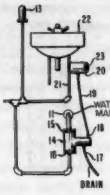
said barrier including an orifice for coupling said one port on

one side of said barrier to the other side thereof and to said fourth port,

means for closing said orifice,

means utilizing hydraulic pressure present at said one port for reversing the coupling between said one port and said second and third ports,

said means for reversing including thermally sensitive means



for applying hydraulic pressure from the protected system to said fourth port to create unequal hydraulic forces on opposite sides of said barrier to move said barrier in the direction of said applied pressure and to open said orifice thereby further applying pressure from said one port to said other side of said barrier whereby said protected system is isolated from said source and said protected system is coupled to said drain.

4,360,037

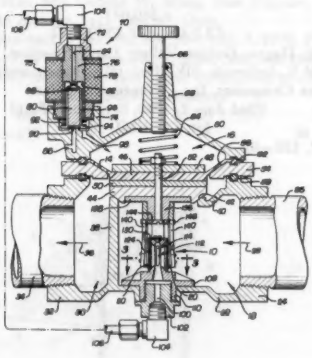
SELF-CLEANING FILTER ASSEMBLY FOR SOLENOID-ACTUATED VALVE

Giles A. Kendall, Glendora, Calif., assignor to Anthony Manufacturing Corp., Azusa, Calif.

Filed Jan. 5, 1981, Ser. No. 222,485

Int. Cl.³ B08B *1/00*; F16K *31/02*; F16L *55/24*

U.S. Cl. 137—242 **36 Claims**



1. In a solenoid-actuated valve of the type including an inlet chamber and an outlet chamber, a diaphragm operated by fluid pressure for opening and closing a valve between the inlet and outlet chambers, a control chamber for receiving control fluid from the inlet chamber, and a solenoid for controlling the fluid pressure in the control chamber so that in one condition of the solenoid, fluid pressure within the control chamber acts on the diaphragm to maintain the valve in a closed position, and in another condition relieves the fluid pressure within the control chamber to permit the diaphragm to deflect into the control chamber to move the valve to an open position, the improvement comprising:

a self-cleaning filter assembly disposed in the inlet chamber of the valve, said filter assembly including a filter element through which control fluid from the inlet chamber must flow to the control chamber, and a cleaning element including at least one scraper blade and scrapper blade arm having sufficient deflection for urging said scraper blade into engagement with said filter element, said cleaning element and said filter element being movable one relative to the other, and one of said cleaning element and said filter element being coupled for movement with the diaphragm so that upon movement of the diaphragm for opening and closing the valve, said scraper blade scrapes said filter element to remove filtered matter accumulated on said filter element.

4,360,038

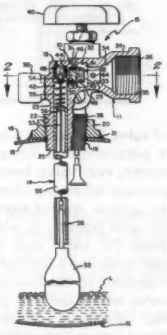
MAGNETICALLY-OPERATED VALVE

Joseph C. Trinkwalder, Jr., North Tonawanda, N.Y., assignor to Sherwood Selpac Corporation, Lockport, N.Y.

Filed Aug. 18, 1980, Ser. No. 178,692

Int. Cl.³ F16K *21/18, 33/00*

U.S. Cl. 137—390 **6 Claims**



1. A valve adapted to be mounted on a cylinder containing a liquid and operable to prevent such liquid contents from being totally withdrawn from said cylinder, comprising:

a body adapted to be mounted on said cylinder and having a passageway for permitting flow of gas therethrough and having a seat surrounding said passageway;

an element mounted in said body for movement toward and away from said seat, said element having a portion thereof arranged to sealingly engage said seat when said element is moved selectively toward said seat and having a magnetic pole;

a magnet mounted in said body for movement between a first position at which said element pole will be proximate the opposite pole of said magnet for causing said element to be moved away from said seat, and a second position at which said element pole will be proximate the like pole of said magnet for causing said element to be moved toward said seat;

an actuator arranged to move said magnet in response to variation in the level of said liquid within said cylinder, said actuator including a float arranged to sense the level of said liquid, and a rod connecting said float and magnet, said magnet being mounted for movement within said body in a direction substantially perpendicular to the direction of movement of said element; and

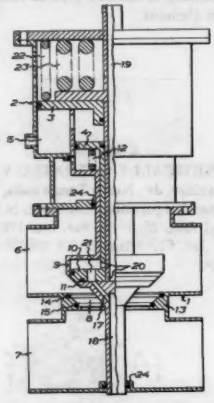
an override mechanism mounted on said body and selectively operable to displace said element away from said seat when said magnet is in said second position to permit flow of fluid through said passageway.

4,360,039

VALVES

Hakan E. O. Jeppsson, Akerlyckan 27, S-245 00 Staffenstorp, Sweden

Filed Nov. 19, 1980, Ser. No. 208,402
Claims priority, application Sweden, Nov. 20, 1979, 7909590
Int. Cl.³ F16K *11/20*
U.S. Cl. 137—614.19 **8 Claims**



1. A leak-proof valve comprising a housing having an upper portion, a lower portion and a valve seat defining an axial passage therebetween; two valve heads axially movable with respect to the valve seat between a closed position in which the valve heads bear against spaced-apart ring portions of the valve seat, and an open position in which the valve heads are axially cleared from the valve seat, said valve heads being axially spaced apart to define a leakage cavity therebetween; a bleeder outlet connected to the leakage cavity; a third valve head axially movable within the leakage cavity and configured to conform to the valve seat surface between the two ring portions thereof; and means for moving the third valve head for opening a communication from a region between the two ring portions of the valve seat to the bleeder outlet first after the two valve heads are moved into the closed position, and for closing said communication before the two valve heads are moved toward the open position.

4,360,040

MULTIPLE ORIFICE VALVES

Harry R. Cove, Huntington Beach, and John D. Muchow, Long Beach, both of Calif., assignors to Smith International Inc., Newport Beach, Calif.

Filed Feb. 27, 1980, Ser. No. 125,273
Int. Cl.³ F16K *47/04*
U.S. Cl. 137—625.3 **27 Claims**

1. An orifice flow control valve having an open position and a closed position comprising:

a valve body;

a downstream disk fixed in the valve body;

an upstream disk concentric and in face-to-face engagement with the downstream disk;

an upstream chamber in the valve body upstream from the upstream disk;

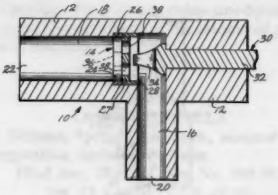
a downstream chamber in the valve body downstream from the downstream disk;

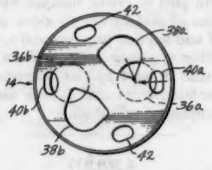
a pair of downstream fluid flow holes through the downstream disk in communication with the downstream chamber;

a pair of upstream fluid flow holes through the upstream disk in communication with the upstream chamber;

means for rotating the upstream disk relative to the downstream disk between a closed position with the upstream holes out of alignment with the downstream holes and an open position with the upstream holes in alignment with the downstream holes; and

at least a pair of auxiliary holes through the upstream disk in communication with the upstream chamber, a portion of each such auxiliary holes overlapping a portion of each





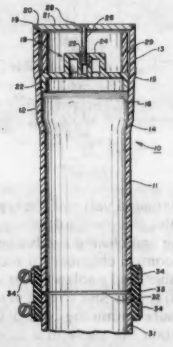
such downstream hole in a range of positions between the open position and the closed position so that the auxiliary holes are closed in both the valve open and valve closed positions and are at least partly open at an intermediate position between the valve open and valve closed positions.

4,360,041

CLEANOUT FITTING

John D. Hagan, Golden Valley; Larry Swanson, Hamel, and David E. Anderson, Elk River, all of Minn., assignors to The Cretex Companies, Inc., Minneapolis, Minn.

Filed Jun. 2, 1980, Ser. No. 155,213
Int. Cl.³ F16L *55/24*
U.S. Cl. 138—89 **17 Claims**



1. A cleanout fitting comprising:

an elongated pipe being of one piece synthetic plastic construction and being generally cylindrically shaped and hollow throughout its entire length, said pipe having a cylindrical lower pipe section with a generally cylindrical internal surface, the internal diameter of the lower pipe section being substantially uniform throughout, a cylindri-

cal intermediate pipe section with a generally cylindrical internal surface integrally connected with said lower pipe section along the entire top edge of said lower pipe section, the internal diameter of the cylindrical intermediate pipe section being substantially uniform throughout, a cylindrical upper pipe section with a generally cylindrical internal surface integrally connected with said intermediate pipe section along the entire top edge of said intermediate pipe section, the internal diameter of the upper pipe section being substantially uniform throughout, said intermediate pipe section having a plurality of internal threads, the internal cylindrical surfaces of said lower pipe section, said intermediate pipe section and said upper pipe section forming a continuous internal surface which is free of any structure attached to and disposed radially inwardly of the internal cylindrical surfaces of said lower pipe section, said intermediate pipe section and said upper pipe section, said intermediate pipe section being larger in internal diameter than said lower pipe section and said upper pipe section being larger in internal diameter than said intermediate pipe section;

a plug member having a plurality of external threads engaged with said plurality of internal threads;

means facilitating the rotation of said plug member;

a cover plate seated against an upper portion of said pipe section; and

means for retaining said cover plate relative to said pipe section including connection means for selectively connecting said cover plate to said plug member.

4,360,042

ARCHED CONDUIT WITH IMPROVED CORRUGATIONS

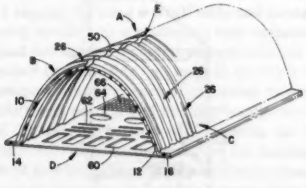
James L. Fouss; John J. Parker; James L. Child, Jr., all of Findlay, Ohio, and Donald W. Sting, New Canaan, Conn., assignors to Hancor, Inc., Findlay, Ohio

Continuation-in-part of Ser. No. 967,514, Dec. 7, 1978, Pat. No. 4,245,924. This application Jul. 1, 1980, Ser. No. 164,969

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ F16L *11/11;* E02B *11/00*

U.S. Cl. 138—119 **24 Claims**



8. A conduit comprising: a longitudinally elongated element which has an apex area disposed substantially at the top of the element and a pair of displaced longitudinal terminal side edge areas disposed generally at the bottom of the element, the terminal side edge areas defining a generally planar base area therebetween; the elongated element having a plurality of transverse corrugations extending from the apex area to both of said terminal side edge areas; said corrugations comprising outward extending peak portions and inward extending valley portions, the peak portions comprising corrugation walls and top walls connecting alternate pairs of corrugation walls, the top walls having a recess between the connected pairs of corrugation walls, the valley portions comprising valley walls connecting alternate pairs of corrugation walls; and, a generally flat base connected between said terminal side edge areas.

4,360,043

COMPONENT LEAD WIRE CUTTING EQUIPMENT

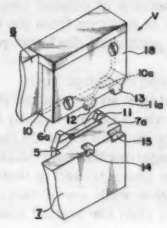
Yoshinobu Maeda; Fumikazu Taniguchi, both of Katano, and Kazuhiko Narikiyo, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

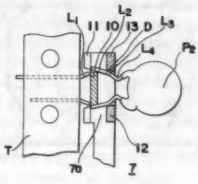
Filed Feb. 15, 1980, Ser. No. 122,076

Claims priority, application Japan, Feb. 15, 1979, 54/17021

Int. Cl.³ H05K *3/32*

U.S. Cl. 140—105 **8 Claims**





1. A component lead wire cutting apparatus of the type for cutting off end portions of lead wires extending in generally the same direction from the body of an electrical component and for shaping the remaining unremoved portions of the lead wires, said apparatus comprising:

a cutter unit including first and second cutter blades movable toward each other to a closed cutting position and away from each other to an open non-cutting position;

said first and second cutter blades having thereon cooperative cutting means for, with the lead wires of an electrical component extending between said first and second cutter blades, and during movement of said first and second cutter blades from said non-cutting position thereof to said cutting position thereof, spreading said lead wires away from each other and cutting off the outer end portions of said lead wires, whereby unremoved portions of said lead wires remain connected to the body of said electrical component; and

regulating means for, during said spreading apart of said lead wires, controlling the extent of movement in the spreading directions of said unremoved portions of said lead wires, and thereby for preventing excessive spreading of said unremoved portions and breaking of said body.

4,360,044

POLYMER MIXING APPARATUS

Peter M. Wisneski, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1981, Ser. No. 250,988

Int. Cl.³ B65B *1/04*

U.S. Cl. 141—9 **10 Claims**

5. A process for preparing a large batch of particulate material having a substantially uniform composition throughout which consists essentially of:

A. Filling in sequence a plurality of empty, horizontally aligned, essentially cylindrical storage bins with particulate material,

B. Simultaneously emptying each of the storage bins of (A) at a uniform rate onto a conveying means; and

C. Conveying the mixed particulate, material to a packaging station;

the process further characterized in that each storage bin of (A) is essentially identical in volumetric capacity and construction and includes:

(1) a principal section that is essentially cylindrical in shape,

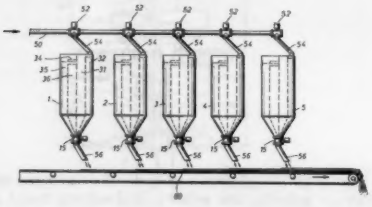
(2) a bottom section of conical shape to provide ready gravity flow of particles from the bin,

(3) a centrally positioned discharge port in the bottom of the bin,

(4) a valve in said discharge port,

(5) a series of at least six vertical partition walls within the bin, each of which extends radially from the midpoint of the bin to the bin wall to divide the bin into at least six storage compartments, said vertical partition walls being further characterized in that;

(a) the partition walls are of varying height with each wall, other than the highest wall, being higher than



one adjacent wall and lower than the other adjacent wall,

(b) the angles formed between each adjacent pair of partition walls being substantially equal so that each storage compartment has substantially an equal volumetric capacity,

(c) the differences in height of the partition walls are such that as each storage compartment is filled with particles, additional particles added to the top of said compartment readily overflow into the adjacent compartment, and

(d) the bottom of each partition wall extends to within inches of the discharge port, the bottom construction of the partition walls bein such that particles flow by gravity at substantially equal volumetric rates from each compartment when the valve of the discharge port is opened, and

(6) an inlet port in the top of the bin positioned so that particles fed therethrough flow by gravity directly into the compartment defined by the first and second highest vertical partition walls.

4,360,045

FILLING ELEMENT FOR COUNTERPRESSURE FILLING MACHINES

Egon Ahlers, Neu-Bamberg, Fed. Rep. of Germany, assignor to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany

Filed Dec. 31, 1980, Ser. No. 221,789

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1980, 3001099

Int. Cl.³ B67C *3/06*

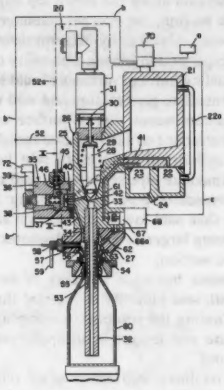
U.S. Cl. 141—39 **18 Claims**

1. A filling element, for counterpressure filling machines, and including a controlled pressurized gas valve arrangement for generating a gas pressurization in a pressed-on container, which is to be filled with liquid, prior to introducing liquid into the container, said filling element further comprising:

a liquid flow valve which opens under the influence of an opening spring upon termination of pressurization;

a valve actuating device for closing said liquid flow valve against the influence of said opening spring;

an electrical switching member, associated with said valve actuating device, which, when contacting the liquid rising in said container, serves for generating a closure-control signal for said valve actuating device to occupy the closed position;



a control switch also associated with said valve actuating device; and

a device, which is independent of said switching member, for controlling said control switch in such a way that when liquid contact is lacking at said switching member, a closure-control signal for said valve actuating device is maintained at most until termination of pressurization.

4,360,046

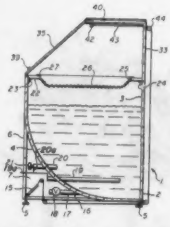
SANITARY WASTE GREASE DISPOSAL APPARATUS

Philip N. Streit, 3505 Lockheed, Midland, Tex. 79703, and Lyle E. Leininger, Rte. 8, Box 537, Lakeside, Tex. 76108

Filed Jun. 9, 1980, Ser. No. 157,552

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—82 **21 Claims**



1. A sanitary system for collection, storage and transportation of waste fatty material for reprocessing which comprises

a sanitary storage unit for collection and storage of waste fatty materials of edible fatty origin,

said storage unit including an enclosed bin of sealed fluid tight construction having a top opening for introduction of fatty materials being collected and a bottom outlet opening for removal of the contents to a tank truck for transportation,

a self opening lid for said top opening,

means for straining contaminating materials from the fatty materials being collected,

means for mitigating the growth of bacteria in said storage unit,

means for supplying controlled heat to said storage unit to keep the contents fluid,

a tank truck for transportation of the fluid fatty materials collected in said storage unit,

means including a pump and hose for connection to the outlet from said storage unit for pumping the contents thereof to said tank truck, and

electric heating means in the tank of said tank truck for maintaining the contents fluid during transportation to a facility for reprocessing.

4,360,047

TRANSPORTABLE MACHINE-TOOL

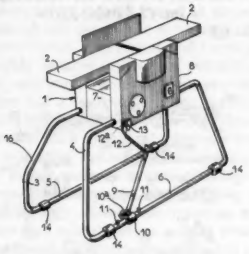
Jean-Claude Maret, Paris, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Sep. 12, 1980, Ser. No. 186,805

Claims priority, application France, Sep. 17, 1979, 79 23092

Int. Cl.³ B27C *1/14*

U.S. Cl. 144—117 R **18 Claims**



1. In a collapsible machine, in particular a machine-tool, comprising a support forming a work table and containing an electric driving motor and a machining unit associated with said motor, and feet means; the improvement wherein said feet means comprises two foldable feet each in the form of a flattened bow-shaped structure, each foot having two end portions and a flattened portion and being pivotally mounted on two ends of the support by said end portions, the flattened portion of each foot constituting a region for bearing on the ground, both of said bow-shaped structures being dimensioned and configured to circumscribe an area greater than that of a maximum vertical section of said support to enable the support to freely pass through both of said structures during a pivotal collapse of said machine from an erected, operable configuration to a folded, transport and storage configuration, and a first one of said bow-shaped structures being dimensioned and configured to circumscribe an area greater than that of a second one of said bow-shaped structures to enable said second structure to at least partially pass through said first structure during a pivotal collapse of said machine, said feet being approximately parallel in said erected configuration with the support disposed above them, and crossed in said folded configuration with the support disposed within them, said feet means further comprising means for immobilizing the feet in an unfolded position thereof.

4,360,048

POWER DRIVEN, HAND OPERATED PLANE

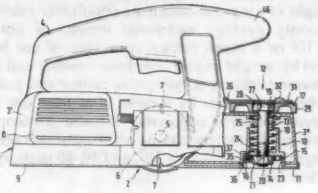
Fritz Schädlich, Leinfelden-Echterdingen; Gerhard Armbruster, Stuttgart-Plieningen; Werner Neubert, Stuttgart, and Peter Stierle, Waldenbuch, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,545

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 7934812[U]

Int. Cl.³ B27C *1/10*

U.S. Cl. 145—4 **13 Claims**



1. In a power driven, hand operated plane including a housing, a handle on the housing, a rotary shaft arranged within the housing for supporting at least one planing knife, a first guiding plate mounted on the housing and adjoining the path of movement of the planing knife, an adjustable shoe guided in the housing, a second guiding plate formed on the shoe and adjoining the path of movement of the planing knife opposite the first guiding plate, a combination comprising an adjustment device mounted on the device and engaging said shoe, said adjustment device including a control disk arranged in the housing opposite said shoe and being provided on its face with a control dial; a screw spindle attached at one end thereof to said control disk; a spindle nut attached to said shoe and engaging the other end of said spindle; a biasing spring provided between said housing and said shoe; and stop means formed between said control disk and said housing to limit the rotation of said control disk.

4,360,049

RADIAL TIRES HAVING IMPROVED IRREGULAR WEAR RESISTANCE

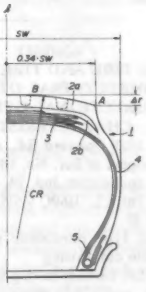
Isamu Imai, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,671

Claims priority, application Japan, Mar. 10, 1980, 55-29898

Int. Cl.³ B60C *3/00, 9/18*

U.S. Cl. 152—209 R **11 Claims**



1. In a radial tire having improved irregular wear resistance, which are reinforced with a belt cord layer and a carcass cord layer, the improvement which comprises:

having a crown radius CR (in mm.), a radius of curvature of

the ground contact surface of the tread at the cross-section containing the rotation axis of the tire, which is given by the following formula:

$$CR \cong \sqrt{1.57(SW)^2+7.153}+81.0$$

wherein SW (in mm.) represents the tire width under no load and standard inflation pressures as defined by The Tire and Rim Association, Inc.; and

using, for at least the ground contact area of the tread, a rubber composition consisting essentially of 100 parts by weight of a styrene-butadiene copolymer rubber having a viscosity average molecular weight of not less than 2×10^5 or a blend rubber consisting of not less than 30 parts by weight of said copolymer rubber and at least one of natural rubber, polyisoprene rubber and polybutadiene rubber, 5–60 parts by weight of at least one of a liquid styrene-butadiene copolymer, a liquid polyisoprene and a liquid polybutadiene having a viscosity average molecular weight of $2\times10^3-1.5\times10^5$, and 40–90 parts by weight of carbon black.

4,360,050

LOW PRESSURE LOW SPEED TIRE

Eiji Nakasaki, Kakogawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed May 7, 1980, Ser. No. 147,345
Claims priority, application Japan, May 6, 1979, 54-60738
Int. Cl.³ B60C *9/00, 15/00*
U.S. Cl. 152—354 R **2 Claims**

1. A low pressure, low speed tire for leisure vehicles utilizing operating pressures not exceeding three pounds per square inch and having improved mechanical strength and operational stability consisting essentially of a crown portion and side wall portions, said portions having a carcass-ply containing at least two sets of synthetic fibre monofilaments with one set disposed at approximately 90° relative to the other set and forming a pattern, one set of monofilaments being disposed at angles of 75 to 90 degrees with respect to the equator plane of the tire and a rubber layer overlying said carcass-ply.

4,360,051

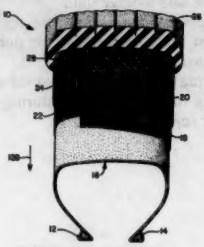
PNEUMATIC TIRE AND TIRE CARCASS, SOME HAVING DIRECTIONAL OTHERS HAVING NON-DIRECTIONAL OPERATIONAL CHARACTERISTICS

Clyde R. Wykoff, 1929 Ganyard Rd., Akron, Ohio 44313

Continuation-in-part of Ser. No. 104,047, Dec. 17, 1979, abandoned. This application Jun. 24, 1981, Ser. No. 277,052
Int. Cl.³ B60C *9/06, 9/20*
U.S. Cl. 152—356 R **10 Claims**

1. A directional type pneumatic tire having a preferred direction of rotation comprising

a confluent ply tire carcass having a crown area and having beads therein, and a tire tread on the tire carcass, and wherein said tire carcass includes one two piece confluent ply construction or assembly, with each confluent ply piece including cords and said cords being positioned at a specific bias angle to a radial line at the center of the crown area of the carcass, all of said cords of each confluent ply piece being positioned at one uniform bias angle that ranges between 2° and 29° inclusively for a given tire



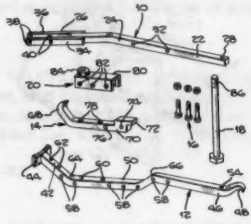
design, said cords all being inclined in one rotary direction, and a conventional high rigidity belt ply in the tire crown to provide rigidity.

4,360,052

PORTABLE TIRE TOOL

Peter J. Norris, 9640 Stonehurst Ave., Sun Valley, Calif. 91352

Filed Dec. 17, 1981, Ser. No. 331,639
Int. Cl.³ B60C *25/04*
U.S. Cl. 157—1.3 **9 Claims**



1. A portable tire tool kit adapted for removing and installing tires on wheel rims having central hubs comprising:

a lever arm having a handle portion at one end, a neck portion, and a fulcrum portion at the other end;

a tire pry arm having a first end portion including a tire contact surface, a second end portion including a tire pry surface and a middle portion;

a J-shaped hook arm having a hook portion on one end, a middle portion and a straight end portion on the other end;

mounting means for rotatably mounting said lever arm to said wheel rim central hub;

means associated with said lever arm handle portion for releasably connecting said lever arm to said mounting means;

means associated with said lever arm fulcrum portion for connecting alternately to said mounting means, said hook arm middle portion and said tire pry arm tire pry surface; and

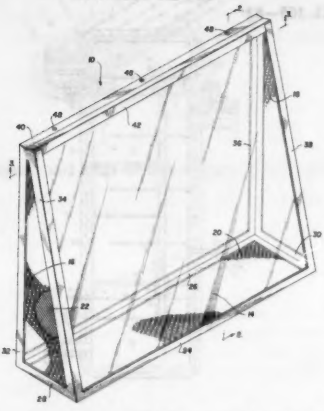
means associated with said lever arm fulcrum portion for releasably connecting to said tire pry arm middle portion, said tool kit being connectable in various configurations for removing and installing tires.

4,360,053

GLASS FIREPLACE SCREEN

Carrol E. Buckner, Weaverville, N.C., assignor to Buck Stove Corporation, Asheville, N.C.

Filed Oct. 26, 1977, Ser. No. 845,705
Int. Cl.[3] E06B 9/00
U.S. Cl. 160—352 11 Claims



1. A fireplace screen comprising:

a front face having a rectangular frame, an air-impermeable transparent panel and means for mounting said panel to said rectangular frame, a portion of said rectangular frame being removably secured thereto for permitting removal of said panel, said removable portion comprising a fixed frame member and a removable frame member, said removable frame member having connected thereto at least two tab elements, each of said tab elements having a planar surface extending across said fixed frame member, each of said planar surfaces having openings to receive fastening means therethrough, said fastening means further being removably received in openings in said fixed frame member and said openings in said planar surfaces and said fixed frame member being aligned to receive said fastening means in a direction substantially normal to the planar surfaces of said tab elements;

a pair of side faces each having a triangular frame rigidly connected to opposed edges of said rectangular front frame so as to incline said front face relative to the horizontal, and open mesh secured to said triangular frame; and

a bottom frame member rigidly interconnecting the rear bottom of said triangular side frames.

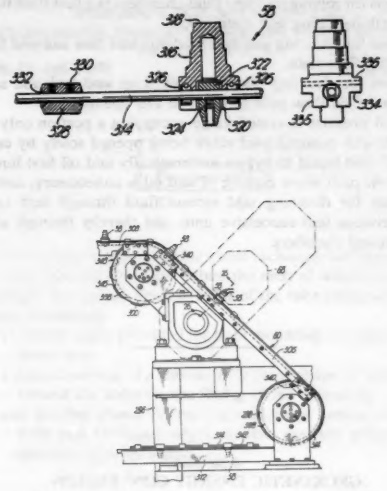
4,360,054

DIE CASTING MACHINE TRANSFER SYSTEMS

Guido Perrella, Senneville, Canada, and William E. Thompson, Anderson, Ind., assignors to DBM Industries Limited, Quebec, Canada

Division of Ser. No. 929,148, Jul. 31, 1978, Pat. No. 4,248,289.
This application Sep. 29, 1980, Ser. No. 191,605
Claims priority, application United Kingdom, Dec. 1, 1977, 50179/77; Canada, Jun. 12, 1978, 305228
Int. Cl.[3] B22D 17/20, 29/00
U.S. Cl. 164—269 1 Claim

1. A transfer system for carrying cast parts from a casting machine to a secondary operation comprising an endless conveyor cable adapted to be trained between dies of a die casting machine and said secondary operation; a plurality of fingers adjustably mounted for limited free movement on said cable for sequential positioning between said dies to receive a casting therearound; sprockets associated with said cable for driving said cable; adjustable link means on said cable for engagement by said drive sprocket; and wherein each of said fingers comprises a body having a socket in a lower end thereof and a plug member secured to said cable and positioned in said socket,



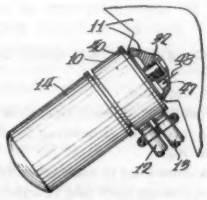
said body socket having sufficient clearance around said plug member to provide limited free movement of the body thereon, and means retaining the body on the cable and plug member.

4,360,055

HEAT EXCHANGER

Donald J. Frost, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Sep. 8, 1976, Ser. No. 721,564
Int. Cl.[3] F28F 3/12
U.S. Cl. 165—38 4 Claims



1. A heat exchanger for exchanging heat between two fluids, comprising:

a plurality of heat exchange units each comprising a pair of plates joined permanently together at peripheral edges;

first spacer means in each said unit between and joined to said pair of plates and inwardly of said edges defining with said edges a first fluid chamber in each said unit;

a tank enclosing said plurality of units;

means including second spacer means for arranging said units in spaced series in said tank to provide a second fluid chamber between each pair of said units and also for separating said first fluid chambers from said second fluid chambers;

means for providing successive flow openings in said successive units in said series, said successive flow openings being defined by plate edges and said second spacer means comprises seal members located at and surrounding said edges;

means for joining said first fluid chambers in a first fluid flow path including said openings;

means for directing said first fluid into said tank and said first fluid flow path;

means for directing said first fluid from said tank and said first fluid flow path through an exit opening;

an oil pressure operated valve occupying a portion only of the exit opening, said valve being opened solely by cold oil first liquid to bypass automatically said oil first liquid flow path when cooling of said oil is unnecessary; and

means for directing said second fluid through said tank between said successive units and thereby through said second chambers.

4,360,056

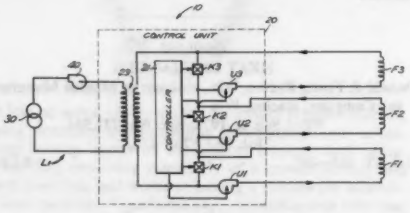
GEOKINETIC ENERGY CONVERSION

Thomas F. O'Connell, Spencertown, N.Y., assignor to Spencertown Geo-Solar Associates, Spencertown, N.Y.

Filed Mar. 19, 1980, Ser. No. 131,741

Int. Cl.³ F25D *23/12*

U.S. Cl. 165—45 **18 Claims**



1. A geothermal energy conversion system comprising:

(i) a heat transducer;

(ii) a first heat transfer fluid;

(iii) a plurality of geothermal fields located in the earth each said field having means for circulating the first heat transfer fluid therethrough;

(iv) control means connected to each said circulating means for selectively operating each said circulating means;

(v) a second heat transfer fluid;

(vi) a heat exchanger for transferring heat from the first heat transfer fluid circulated within said field to the second heat transfer fluid in heat exchange relation therewith, or for transferring heat to the first heat transfer fluid circulated within said field from the second heat transfer fluid in heat exchange relation therewith;

(vii) means for selectively operating the control means to activate said circulating means associated with said given field and thereby circulate the first heat transfer fluid through said given field and through said heat exchanger; and

(viii) means for circulating said second heat transfer fluid from said heat exchanger to said heat transducer.

4,360,057

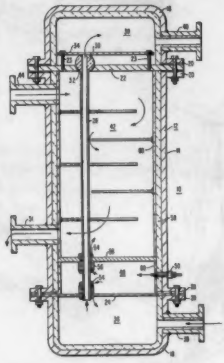
HIGH TEMPERATURE ABRASIVE RESISTANT HEAT EXCHANGER

Valentin Koump, Hempfield Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 49,688, Jun. 18, 1979, Pat. No. 4,279,293. This application Feb. 6, 1981, Ser. No. 232,349

Int. Cl.³ F28F *9/06*

U.S. Cl. 165—82 **3 Claims**



1. A shell and tube heat exchanger comprising:

a. a shell;

b. a plurality of tubes supported within said shell;

c. tube sheets for defining a first, second and third chamber within said shell and for supporting said tubes, portions of said tube sheets being porous, said third chamber being disposed between said first and second chambers, one of said tube sheets comprising hemispherical indentations;

d. means for inletting a first fluid medium into said first chamber, said first chamber being in flow communication with the inside of said tubes;

e. means for flowing a second fluid medium through said second chamber in heat exchange relation with said first fluid;

f. means for inletting a third fluid medium into said third chamber at a pressure higher than that of said first and second chambers such that said third fluid passes from said third chamber into said first and second chambers through said porous portions;

said tubes comprising an integral spherical flange matingly configured to said hemispherical indentations in said one tube sheet.

4,360,058

PROCESS FOR THE PREPARATION OF A SURFACE OF A METAL WALL FOR THE TRANSFER OF HEAT

Herbert Muellejans, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik julius fr. behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 148,736

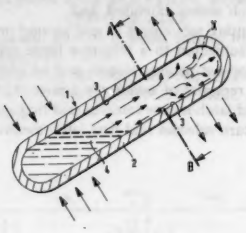
Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919188

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—104.21 **3 Claims**

1. A heat-tube having contained for flow therein a medium which transports and transfers heat and which medium is vaporizable and condensable, said heat-tube having a first portion where the medium is vaporized by the application of heat and a second portion where the medium is condensed, and said heat-tube having an inner metallic wall effective for heat transfer, produced according to the process of providing a mechanically smooth surface of said metallic wall; and chemically etching said smooth surface to an extent that valleys at

least with respect to the original smooth surface, are formed therein with peaks lying on the envelope of said original



smooth surface, said peak-to-valley distance not exceeding 10μ.

4,360,059

TUBE TYPE HEAT EXCHANGER

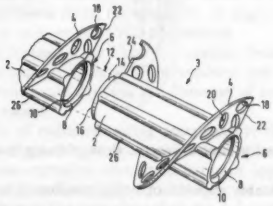
Karl-Heinz Funke, Gronau, Fed. Rep. of Germany, assignor to Funke Warmeaustauscher Apparatebau KG, Gronau, Fed. Rep. of Germany

Continuation of Ser. No. 947,062, Sep. 29, 1978, abandoned. This application Apr. 6, 1981, Ser. No. 251,465

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744263

Int. Cl.³ F28D 7/00; F28F 9/00

U.S. Cl. 165—160 **14 Claims**



1. An element for use in a tube-type heat exchanger comprising:

hollow core means;

spiral baffle means formed integrally with said core means and extending axially thereof, said spiral baffle means being formed on said core means in the form of a spiral which comprises at least part of a coil in said element; and

at least one opening in said spiral baffle means for receiving a pipe extending axially of said core means,

at least one of said core means and baffle means of said element including aligning means adjacent one end thereof for cooperating with complementary aligning means on another element to align said elements and the pipe receiving openings of the elements with each other, said aligning means comprising the ends of said spiral baffle means in each said element being located in a plane radial to the axis of said core means and one said end projects over the end of said core means.

4,360,060

HOLLOWED PLATE FOR A HEAT EXCHANGER WITH FLUID FLOW TUBES

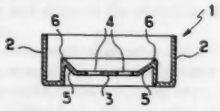
Pierre Collgon, Le Rotrou, France, assignor to Valeo, Paris, France

Filed Jun. 3, 1981, Ser. No. 269,778

Claims priority, application France, Jun. 5, 1980, 80 12550

Int. Cl.³ F28F 9/02

U.S. Cl. 165—173 **12 Claims**



1. A hollowed tube plate for a heat exchanger having at least a water box and fluid flow tubes, the ends of which are to be engaged and tightly fitted in holes of the tube plate, said tube plate comprising:

U-shaped edges provided for tight mounting on edges of the water box;

a central portion of a substantially plane shape in which are formed the holes for the fitting of the tube ends;

and slanting planes connecting said plane central position with said U-shaped edges, so that the tube plate has a deflected general shape.

4,360,061

OIL RECOVERY PROCESS USING POLYMER MICROEMULSION COMPLEXES

Nathan H. Canter, Edison; Max L. Robbins, South Orange, and Edward G. Baker, Berkeley Heights, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 3, 1980, Ser. No. 136,938

Int. Cl.³ E21B 43/22

U.S. Cl. 166—274 **24 Claims**

1. A process for recovering crude oil from a subterranean formation which comprises injecting into the formation a stabilized microemulsion system which contains a polymer-microemulsion complex in an amount effective to displace oil, said microemulsion system comprising

(a) a microemulsion containing as components

(1) an oil,

(2) water having up to 25% by weight of dissolved inorganic salts, and

(3) 0.2 to 15 wt. %, based on the microemulsion, of at least one anionic surfactant balanced to form the microemulsion, and

(b) from 0.1 to 10% by weight, based on the microemulsion of a polar polymer capable of forming a polymer-microemulsion complex wherein the polar polymer has a molecular weight of from 4,000 to 5,000,000 and is selected from the group consisting of branched polyethylene oxide condensation product of polyethylene oxide, bisphenol A and epichlorohydrin and polyvinyl pyrrolidone, the polymer-microemulsion complex being characterized by a complexation energy of at least 2 Kcal/mole, driving the microemulsion system through the formation to displace oil, and recovering the resultant crude oil.

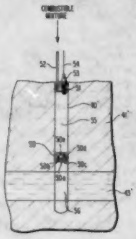
19. The process of claim **1** wherein the microemulsion is driven through the formation with a thickened water or brine.

4,360,062

METHOD OF GASEOUS DETONATION FRACTURING OF WELLS

James A. Browning, Hanover, N.H., assignor to Browning Engineering Corporation, Hanover, N.H.

Filed Mar. 12, 1981, Ser. No. 243,108
Int. Cl.³ E21B *43/26*
U.S. Cl. 166—299 **2 Claims**



1. A process of raising the pressure within a well bore hole extending into an earth formation to increase the flow of fluid from the surrounding earth into the well bore hole, said process comprising the steps of:

introducing a combustible mixture of a gaseous oxidizer and a fuel into a first sealed length of said well bore hole,

igniting said mixture within said first sealed length to create a momentary high pressure wave within said first sealed length, and

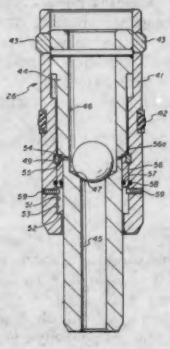
transmitting said pressure wave into a second sealed length of said well bore hole connected to said first sealed length by means of check valve to facilitate a stepwise increase of pressure in said second sealed length such that the increased pressure within said second sealed length functions to fracture the surrounding rock and thereby to release fluid to said well bore hole.

4,360,063

VALVE

Marion D. Kilgore, London, England, assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 4, 1980, Ser. No. 212,995
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—317 **4 Claims**



1. An expendable flow control comprising,

a body,

first latch means extensible from said body,

first prop-out means movable between an upper position proping out first latch means and a lower position releasing said first latch means,

second latch means preventing downward movement of said first prop-out means while the latch means is extended and while said flow control is subjected to a force thereacross,

pressure responsive second prop-out means holding said second latch means extended, and

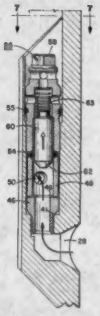
means preventing movement of said second prop-out means until it is subjected to a selective force whereupon said second prop-out means releases said second latch means, and upon removal of said force across the flow control, said second latch means releases said first prop-out means which in turn releases said first latch means.

4,360,064

CIRCULATING VALVE FOR WELLS

John A. O'Connor, III; Warren E. Holland; James D. Burley; Ronald D. Rogers; Fred E. Watkins, and Ben D. Terral, all of Harris County, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Nov. 12, 1980, Ser. No. 206,220
Int. Cl.³ E21B *34/08, 34/10*
U.S. Cl. 166—319 **10 Claims**



1. Apparatus for controlling the flow of fluids in wells comprising:

a valve assembly capable of being positioned in a tubular shaped side-pocket housing of a mandrel connected into a tubing string including;

a cylindrical valve body having an interior seal shoulder and first openings capable of communicating with the interior of said mandrel and second radially spaced-apart openings alignable with radially spaced-apart openings in said housing and a threaded exterior for theadly connecting said body to the interior surface of said housing;

a valve element movable from closed to open positions and vice versa, said valve element having a sealing surface engageable with said sealing surface of said valve body when in said closed position in said valve element permitting flow of fluids through said second openings and being completely out of the flow path of said fluids when in said open position; and

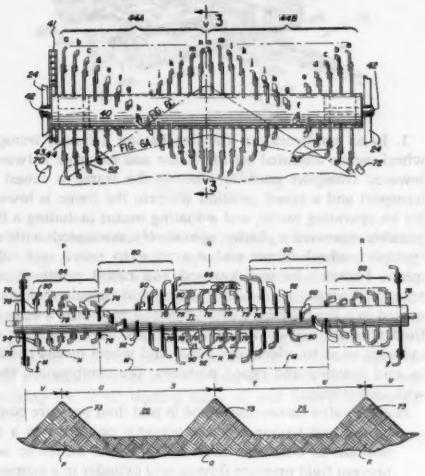
a seal arranged on the interior of said valve body engaging the outer surface of said valve element for wiping said valve element and for providing a pressure differential while said valve element is in the open position to urge said valve element fully open or closed.

4,360,065

CULTIVATOR FOR HIGH EFFICIENCY WINDROW DISINTEGRATION AND AERATION, ROW FORMING, AND THE LIKE

Eugene Jenison, and Andrew Jenison, both of Rte. 3, Box 91D, Siloam Springs, Ark. 72761

Filed May 16, 1980, Ser. No. 150,566
Int. Cl.³ A01B 9/00; B01F 7/04; B02C 21/02
U.S. Cl. 172—119 13 Claims



1. In a cultivator having a frame, wheel means adapted to support the frame over a windrow of material such as compost, power means for rotating said wheel means in a direction to tram the cultivator along the windrow, an improved windrow disintegrator and aerator rotor comprising:

a drum journaled in the frame for rotation about a horizontal axis extending crosswise of the windrow and power means for rotating said drum in the direction of rotation of said wheel means;

a plurality of radial mounting posts fixed to the drum, said posts being arranged in a helical pattern having substantially one complete revolution between opposite ends of the drum, a substantially equal number of said posts being on each side of a central vertical plane along the longitudinal centerline of the frame, said posts being thin relative to the space between adjacent posts measured axially of the drum to minimize shear resistance of the posts within the windrow; and

cultivator blades supported on the outer ends of said posts, each of said blades having at its outer end a transverse paddle portion offset toward said central vertical plane and contoured to move material at the bottom of the windrow selectively sidewise along the ground toward the center of the windrow at said central vertical plane to thereby circulate material in the windrow in two distinct closed flow paths inwardly along the ground from the outer edges, upwardly along the central vertical plane, and then outwardly and downwardly with the aid of gravity along the top surfaces;

whereby repeated passes of said cultivator centered along a windrow circulates material between the inside and the outside of the windrow to aerate it while maintaining the windrow with a triangular cross-section of ever-increasing height and ever-diminishing base width symmetrical in shape and size on opposite sides of said central vertical plane.

7. In a cultivator having a frame, wheel means adapted to support the frame over a windrow of material such as compost, power means for rotating said wheel means in a direction to tram the cultivator along the windrow, an improved windrow disintegrator and aerator rotor comprising:

a drum journaled in the frame for rotation about a horizontal axis extending crosswise of the windrow and power means for rotating said drum in the direction of rotation of said wheel means;

a plurality of radial mounting posts fixed to the drum, said posts being arranged in a helical pattern having substantially one complete revolution between opposite ends of the drum, a substantially equal number of said posts being on each side of a central vertical plane along the longitudinal centerline of the frame, said posts being thin relative to the space between adjacent posts measured axially of the drum to minimize shear resistance of the posts within the windrow; and

cultivator blades supported on the outer ends of said posts, each of said blades being flat in a plane perpendicular to the axis of rotation of the drum, each blade having an outer portion canted or curved backwardly relative to the direction of rotation of the drum, and the leading edge thereof being characterized by a knife-like cutting edge to facilitate shredding paper, magazines, cardboard cartons, and the like.

13. In a cultivator for forming parallel ridges and furrows in a ground surface, a frame, wheel means adapted to support the frame for movement over the ground, power means for rotating said wheel means in a direction to tram the cultivator along the ground, and improved ridge and furrow forming rotor comprising:

a power driven drum journaled in the frame for rotation about a horizontal axis extending crosswise of the line of movement of the frame;

cultivator blades axially and circumferentially spaced in a helical pattern on said drum between opposite ends thereof;

said rotor being adapted to make a plurality of ridges in the ground parallel to the line of movement of the frame, a center one of said ridges being positioned along a central vertical plane intersecting the mid-point of the drum, and at least two other of said ridges being spaced from said center ridge by furrows flanking said center ridge, said other ridges being positioned along other vertical planes intersecting the side portions of the drum;

said cultivator blades comprising predetermined long and short blades;

groups of said short blades being centered at said vertical planes to make said ridges, each group of short blades being flanked on both sides by pairs of groups of said long blades to create furrows spaced apart on opposite sides of the corresponding vertical plane;

all of said blades, regardless of length, having at their extreme outer ends transverse paddle portions offset toward the nearest of said vertical planes and being contoured to move ground surface material sidewise along the ground from the long blades to the short blades toward the nearest ridge;

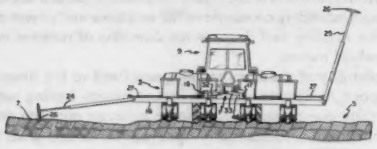
whereby each pair of groups of long blades cooperate to dislodge material from the ground to create a pair of furrows spaced apart on opposite sides of a corresponding one of said vertical planes and move the material sidewise into the space between said furrows, and whereby further the group of short blades between each pair of groups of long blades help create a ridge by heaping said dislodged ground material to a high point along said corresponding vertical plane.

4,360,066

OSCILLATING DEVICE FOR GRAIN DRILLS

Fred W. Mann, Box 444, Waterville, Kans. 66548

Filed Feb. 20, 1981, Ser. No. 236,449
Int. Cl.[3] A01B 35/32
U.S. Cl. 172—130 10 Claims



1. A device for producing alternating outward movement by two opposed members from a centerpoint comprising:

(a) an elongate frame member having opposing end portions and a center portion;

(b) first and second movable members slidably engaging said frame member, each of said movable members movable between an inward position and an outward position relative to said frame member center portion respectively;

(c) motor means connected to each of said movable members selectively biasing each of said movable members between said inward and outward positions respectively;

(d) restraining means securely mounted on said frame member to selectively restrain one of said movable members in said respective inward portion thereof;

(e) selection means to alternately restrain one of said movable members in said respective inward position while allowing the other of said movable members to be motivated by said motor means to move from said respective inward position to said respective outward position and thereafter back to said respective inward position thereby allowing said movable members to alternately and oppositely oscillate between their respective inward and outward positions; and

(f) an elongate link member pivotally attached to each of said first and second movable members at a first end thereof, said link members generally extending from the attachments thereof to respective movable members toward one another; each of said link members including a second end in overlapping relationship to each other and to said frame member center portion when both of said movable members are in the respective inward positions thereof;

(g) said restraining means including:

(1) two spaced apart plates securely positioned on said frame member defining therebetween a passageway adapted to receive therein said link members;

(2) a pair of rollers rotatably mounted on each link member respectively at the second end thereof and on opposing sides thereof; each of said rollers operably riding on a top surface of one of said plates; and wherein

(3) each of said plate top surfaces comprises and presents in succession to an associated roller when an associated movable member is moved from said outward position to said inward position;

(i) a first generally horizontally aligned section;

(ii) a second section inclined upwardly with respect to said surface first section; and

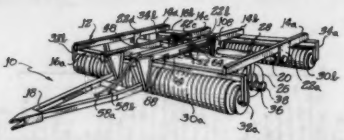
(iii) a cam lock roller retainer having a generally vertical portion adjacent and connected with said plate top surface inclined section and a generally horizontal portion spaced below the location of connection of said roller retainer vertical portion and said plate surface inclined section.

4,360,067

TRANSPORT LOCK SYSTEM FOR AN IMPLEMENT OR THE LIKE

Wayne J. Schaaf, and Bennie J. Boswell, both of Kewanee, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed Apr. 10, 1981, Ser. No. 252,851
Int. Cl.[3] A01B 63/22
U.S. Cl. 172—413 8 Claims



1. In an implement or the like having a frame, transport wheel means mounted on the frame and movable between a lowered transport position wherein the frame is raised for transport and a raised position wherein the frame is lowered for an operating mode, and actuating means including a fluid pressure operated cylinder operatively associated with said transport wheel means and operative to move said wheel means between its said lowered and raised positions upon selective energizing of said cylinder, said cylinder being connected in a fluid pressure control circuit including a source of fluid pressure and operative to supply fluid pressure to said cylinder so as to selectively move said wheel means between its said lowered and raised positions; the combination therewith comprising,

control valve means connected in said fluid pressure control circuit and having a valve actuator operative in a first position to condition said control valve means so as to prevent fluid pressure flow to said cylinder in a manner to move said wheel means from its said lowered transport position to its said raised position, said actuator being movable to a second position conditioning said control valve means to allow fluid pressure flow to said cylinder so as to selectively move said transport wheels between its said lowered and raised positions,

actuator means supported by said frame for operative association with said valve actuator, said actuator means being movable between a locking condition placing said valve actuator in its said first position, and a non-locking condition placing said valve actuator in its said second position, said actuator means including control lever means supported by said frame and operable to bias said actuator means between its said locking and non-locking conditions, said actuator means further including locking pin means supported by said frame for operative association with said valve actuator, said locking pin being longitudinally movable between a locking position placing said valve actuator in its said first position, and a non-locking position placing said valve actuator in its said second position,

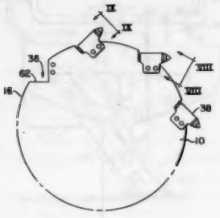
transport lock means operatively associated with said wheel means and cooperative with said actuator means to prevent movement thereof from its said locking condition to its said non-locking condition when said wheel means is in its said lowered position, said transport lock means being operative to enable movement of said actuator means from its said locking condition to its said non-locking condition in response to movement of said wheel means to its said raised position,

said control lever means including an operating handle mounted adjacent the forward end of said frame, and including resilient means interposed between said operating handle and said locking pin enabling said locking pin to be selectively biased between its said locking and non-locking positions.

4,360,068
FURROWING TOOL

Earle W. Stephenson, Latrobe, and Clyde G. Hutzell, Schellsburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 877,045, Feb. 13, 1978, Pat. No. 4,216,832, which is a continuation of Ser. No. 699,491, Jun. 24, 1976, abandoned. This application Mar. 13, 1980, Ser. No. 130,155
Int. Cl.³ A01B 33/10
U.S. Cl. 172—540 5 Claims

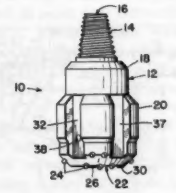


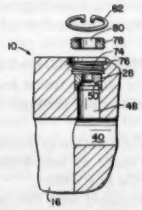
1. A rotary agricultural tool for opening a furrow in a field, comprising; a disc adapted to be driven in rotation, having generally planar sides and a notched peripheral surface when viewed in side view joining said sides; bit elements nonrotatably directly mounted on said notched peripheral surface and having a forward working portion for engagement with the field surface, and compacts of hard wear resistant material having a conical configuration at said compacts' foremost end comprising the fixed leading edge of said forward working portion.

4,360,069
DIAMOND DRILL BITS

Kenneth Davis, P.O. Box 7906, Midland, Tex. 79701

Filed Jul. 21, 1980, Ser. No. 170,901
Int. Cl.³ F21B 10/56
U.S. Cl. 175—393 4 Claims





1. A drill bit having a body member which forms a heat at one end and connecting means at the other end, a face formed on the head in opposition to the connecting means; an axial counterbore formed within said member which upwardly opens at said connecting end, and which terminates in spaced relationship respective to said face;

a plurality of radially spaced nozzle passageways formed into said head, each nozzle passageway having an outlet which terminates at said face;

a nozzle received within the marginal terminal end of each of said nozzle passageways; means by which each said nozzle is affixed to said head and extends through said face, each said nozzle being radially spaced apart from one another and from the axial centerline of the counterbore;

a plurality of radially spaced lateral passageways formed into said head, each said lateral passageway communicates said counterbore with one of said nozzle passageways, so that drilling fluid can flow through said axial passageway, through said lateral passageways, through said nozzle passageways, and through each said nozzle;

a plurality of cutters affixed to said head in spaced relationship to one another;

said nozzle passageways each have an axial centerline aligned parallel to the axial centerline of the counterbore;

said lateral passageways are arranged perpendicular respective to the axial centerline of the counterbore;

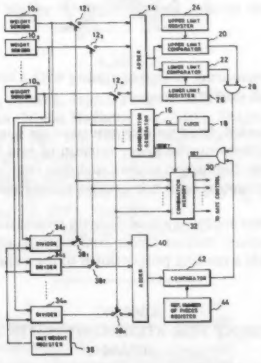
said body member includes a plurality of radially spaced slots formed into the periphery of said head which commences at said face and continues towards said connecting means to provide external flow passageways for returning drilling fluid;

said slots are disposed parallel to said axial passageway, one of said lateral passageways extend from said axial counterbore to one of said slots; and a closure means at the outer end of the lateral passageways which is opposed to the axial counterbore.

4,360,070
COMBINATION WEIGHING DEVICE SELECTING DESIRED WEIGHT AND NUMBER OF ARTICLES

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Ltd., Hyogo, Japan

Filed Dec. 17, 1980, Ser. No. 217,434
Claims priority, application Japan, Dec. 24, 1979, 54-168818
Int. Cl.³ G01G 19/04, 13/00
U.S. Cl. 177—25 2 Claims



1. A combination weighing device, comprising a plurality of weighing balances for weighing a plurality of articles to produce electric signals indicative of the respective measured weights, a first adder circuit for summing up the incoming signals to produce a first sum signal, first normally-open switches having a control input each for coupling therethrough the weight signals from said weighing balances respectively to said adder circuit, means for comparing said first sum signal with a predetermined allowance of weight to produce a first command signal when the sum satisfies said allow-

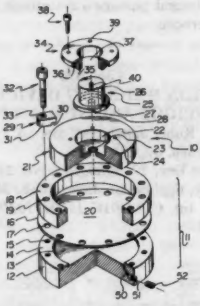
ance, switch control means for providing a predetermined set of combinations of control signals applied to the control inputs of said first switches respectively to close them in accordance with said combinations in turn, and means responsive to said first command signal for storing a current combination of said control signals for utilization, a plurality of detection units associated with said weighing balances respectively for detecting the number of articles on said balances to produce electric signals indicative of the respective detected numbers, a second adder circuit for summing up the incoming signals to produce a second sum signal, second normally-open switches having control inputs coupled respectively to the corresponding outputs of said switch control means for coupling therethrough the number signals from said detection units respectively to said second adder circuit, means for comparing said second sum signal with a predetermined allowable number to produce a second command signal when the sum satisfies said allowance, and means for causing said storing means to be responsive only to presence of both of said first and second command signals.

4,360,071

SEALED LOAD CELL CONSTRUCTION

George J. Dyck, Saskatoon, Canada, assignor to International Road Dynamics Inc., Saskatchewan, Canada

Filed Mar. 7, 1980, Ser. No. 128,361
Claims priority, application Canada, Feb. 15, 1980, 345733
Int. Cl.³ G01G *5/04*
U.S. Cl. 177—208 **21 Claims**



1. A load measuring device operating with a small amount of vertical travel comprising:
(a) a base;
(b) a thin sealed, fixed volume reservoir for a non-compressible fluid forming the lower portion of said base;
(c) a flexible diaphragm sealing said thin reservoir and being in direct contact with non-compressible fluid in said reservoir;
(d) means for applying a load directly to said diaphragm; and
(e) a transducer held in direct contact with said diaphragm to provide a reading proportional to the value of said load.

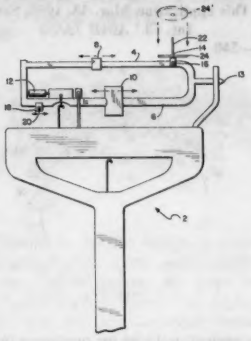
4,360,072

ATTACHMENT FOR ADDING WEIGHTS TO SCALE BEAM

Lloyd S. Call, 1352 E. Center, P.O. Box 4516, Pocatello, Id. 83201

Filed Apr. 22, 1981, Ser. No. 256,546
Int. Cl.³ G01G *21/26*
U.S. Cl. 177—247 **1 Claim**

1. A weight scale with a balancing beam, pivot means intermediate of the ends of the beam, a slidable counterpoise on the beam on one side of the pivot means, adjustable counterweight zero-balancing means for the counterpoise on the other side of the pivot means, the improvement which comprises:
a weight holder comprising a vertical post for retaining weight units, and clamp means on said post for removably and adjustably attaching the same to the beam at a selected position along the length thereof on said one side of the pivot means, said weight units each comprising a disc with a hole through the center thereof for engaging over the



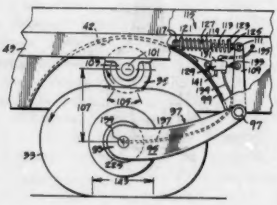
vertical post of the weight holder, a second counterweight, and clamp means for removably and adjustably mounting the second counterweight at a selected position along the length of the beam on said other side of the pivot means, whereby to counter balance the weight of the weight holder and the first-mentioned clamp means.

4,360,073

OFF ROAD VEHICLES WITH AUTOMATIC INFLATION CONTROL SYSTEM

William H. Albee, 1524 Spring Brook Rd., Walnut Creek, Calif. 94596

Division of Ser. No. 866,773, Jan. 3, 1978, abandoned. This application Oct. 6, 1980, Ser. No. 194,284
Int. Cl.³ B60K *17/36, 17/34*
U.S. Cl. 180—74 **3 Claims**



1. An automatic inflation control system for a vehicle of the kind having a flexible-walled, fluid-distensible, load sustaining bag roller, said automatic inflation control system comprising,
a vehicle frame,
a flexible-walled, fluid-distensible, load sustaining bag roller disposed beneath the vehicle frame and mounted for rotation about an axis extending through opposite ends of the bag roller,
a top roller mounted for rotation in trunnions attached to the vehicle frame and about an axis disposed parallel to the axis of rotation of the bag roller,
said top roller being engaged with the top surface of the bag roller to apply a load to the bag roller, and
automatic inflation control means for sensing the distance between the axis of rotation of the bag roller and the axis of rotation of the top roller and for varying the pressure in the bag roller by permitting compressed gas to enter or

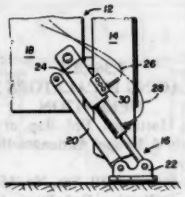
leave the bag roller and thus to maintain a predetermined, desired distance between said axes with all changes in load on the bag roller.

4,360,074

HYDRAULIC ANTI-THEFT DEVICE

Donald J. Parquet, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 8, 1980, Ser. No. 214,535
Int. Cl.³ B60R *25/04*
U.S. Cl. 180—287 **1 Claim**



1. In an earth-working machine including a tractor and implement attachment, said tractor having rear ground-engaging wheels, and a stabilizer arm assembly for stabilizing the tractor on the ground when the implement attachment is in an operative position, and stabilizing arm assembly including a hydraulic piston-cylinder actuator which is extensible to raise the rear tractor wheels off the ground such that the tractor and implement may not be moved, the improvement comprising:

a locking device mounted to said extensible hydraulic actuator, said locking device including an assembly of flow control valves which are selectively movable between an open flow position permitting extension and retraction of said hydraulic actuator and a locked position to prevent hydraulic fluid from leaving the hydraulic actuator when it is extended for raising the tractor wheels off the ground, thereby rendering the machine immovable;

said locking device including a valve body having a series of longitudinally aligned housings for mounting said flow control valves, said valve body including an inlet port connecting a fluid pressure supply line to one of said housings and an oulet port connecting another housing to said hydraulic actuator, said housings being interconnected by a transverse flow passage to permit fluid flow through said body from the inlet port to the outlet port when said control valves are moved to their open flow position;

said locking device including an inlet flow control valve, an outlet flow control valve, and at least one intermediate flow control valve, said inlet and outlet control valves each including a core having an L-shaped flow passage transverse to the longitudinal axis of the core for connecting either the inlet or outlet ports to the transverse flow passage through said valve body, each intermediate flow control valve including a core with a flow passage, said flow passage being selectively aligned with the flow passage through the valve body to permit fluid flow through the body from the inlet port to the outlet port when the inlet and outlet control valves are positioned for open flow;

said control valves including rotatable indicator knobs at one of their ends for setting the open flow and locked positions of the valves, each knob including indicia which is selectively aligned with the ends of the flow passages through the control valves to provide the operator with a means of selectively setting the valves to an open flow or locked position, and said valve knobs being adjustable such that the operator may periodically change the combination for the locking device; and

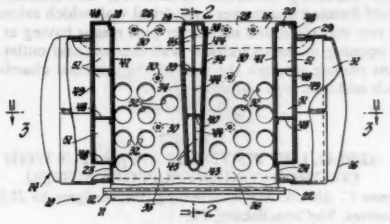
said knobs including removable cover means for hiding the combination used to unlock the device when the machine is in operation.

4,360,075

LOW BACK PRESSURE EXHAUST SILENCER FOR DIESEL LOCOMOTIVES

Dwight A. Blaser, Sterling Heights, Mich.; David J. Goding, Willow Springs, Ill., and Karl U. Ingard, Kittery Point, Me., assignors to General Motors Corporation, Detroit, Mich.

Filed May 11, 1981, Ser. No. 262,464
Int. Cl.³ F01N *1/02, 1/08*
U.S. Cl. 181—250 **4 Claims**



1. A low back pressure exhaust silencer for turbocharged diesel locomotives, said silencer comprising

a straight exhaust duct having inlet and outlet ends connected by walls including two opposite sides,

expansion chamber defining means adjacent said duct and communicating therewith through a plurality of ports in said opposite sides, said expansion chamber means being tuned to respond to and attenuate a fundamental low frequency exhaust noise peak of the associated engine, and

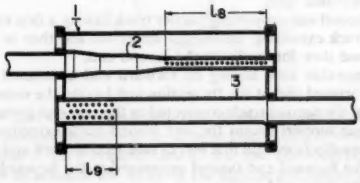
means defining reactive chambers covered by perforated walls in said duct, said reactive chamber means defining divider means extending longitudinally of the duct and laterally between and connecting said opposite sides transversely of the duc' to divide said duct into a plurality of straight parallel flow areas, each communicating with said expansion chamber through said sides and with a portion of said reactive chambers through said perforated walls, said reactive chambers being sized to attenuate a selected range of higher frequency engine exhaust noise.

4,360,076

MUFFLER

Eizo Suyama, Mitaka, Japan, assignor to Nihon Rajieeta Kabushiki Kaisha (Nihon Radiator Co., Ltd.), Tokyo, Japan

Continuation of Ser. No. 780,626, Mar. 23, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,596
Claims priority, application Japan, Mar. 24, 1976, 51-34476; Apr. 2, 1976, 51-39471; Apr. 26, 1976, 51-51191; May 12, 1976, 51-58853; May 19, 1976, 51-62568
Int. Cl.³ F01N *1/08*
U.S. Cl. 181—265 **14 Claims**



1. A muffler for attenuating sound pulsations in exhaust gas,

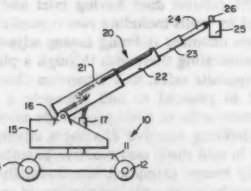
comprising a sealed main body, including a curved housing of circular or elliptical cross-section and forward and rear end plates joined to said housing, said housing and end plates forming a principal chamber, each of said end plates having an aperture therein spaced apart from said curved housing, inlet pipe means traversing said aperture in said forward end plate sealingly for introduction of gas into said chamber, that part of said inlet pipe means within said chamber having a forward and a rearward portion and a downstream end on said rearward portion, and outlet pipe means traversing said aperture in said rear end plate for exhausting gas from said chamber, that part of said outlet pipe means within said chamber having a forward and a rearward portion and an upstream end on said forward portion extending to said forward plate, said inlet pipe means becoming narrower toward the downstream end thereof forming a narrower cylindrical wall which extends to said rear end plate, and said outlet pipe means having at least one opening in the cylindrical wall thereof, said outlet pipe means passing through the wall of the principal chamber at which said inlet pipe terminates.

4,360,077

AERIAL LIFT PLATFORM APPARATUS WITH CONTROL CONDUIT SUPPORT SYSTEM

Thomas C. Abbott, McConnellsburg, Pa., assignor to JLG Industries, McConnellsburg, Pa.

Filed Jul. 2, 1980, Ser. No. 165,626
Int. Cl.³ B66F 11/04
U.S. Cl. 182—2 13 Claims



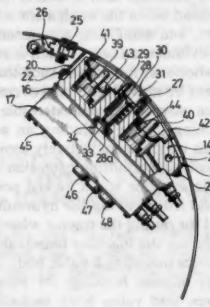
1. An aerial lift platform apparatus comprising:
an extensible, four section telescopic boom including base, inner mid, outer mid and fly sections,
a workman's platform supported at the outer end of the boom on the fly section,
a control console at the workman's platform for controlling said apparatus,
flexible control conduits connected to said control console and extending between said control console and the inner end of the base section, and
means for supporting said flexible control conduits comprising;
a tube fixed on a side of the base section,
a movable tube having its forward end secured to the outer end of the inner mid section and extending rearwardly therefrom,
a self-supporting carrier track having one end adjacent the forward end of said fixed tube, extending first rearwardly therefrom and thence through a bight and then forwardly, and having the other end connected to the rear of said movable tube,
a second self-supporting carrier track having a first end, said track extending rearwardly therefrom and then in a bight and then forwardly to the second end,
a movable tube having its forward end connected to the forward end of the fly section and having the second end of the second track connected to the rear end thereof, and
linear support means for said second track extending rearwardly from said first end of said second track and having the forward end thereof connected at the forward end of the inner mid section,
said control conduits extending through said tube fixed on the base section, the first track, the first mentioned movable tube, the second track, and the tube fixed to the fly section.

4,360,078

DEVICE FOR PLACING ESCALATORS IN AND OUT OF OPERATION

Klaus Schöneweiss, Hattingen, Fed. Rep. of Germany, assignor to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,685
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1979, 2922831
Int. Cl.³ B66B 9/20
U.S. Cl. 187—12 8 Claims



1. In a device for placing an escalator in and out of operation and having a system comprising safety switches, actuating elements and signal bodies, the improvement in which the system comprises:
a flap outwardly swingably mounted on the escalator, said flap having a rear side defining one surface facing an interior of the escalator in a normal position of the flap, and a front side defining another surface facing an exterior of the escalator in the normal position of the flap,
the actuating elements constitute means for starting and stopping, respectively, the escalator, and include a first actuating means comprising a push-button for placing the escalator out of operation actuatable when said flap is in the normal position and disposed at said another surface non-projectingly relative the latter when said flap is in the normal position and a second actuating means actuatably disposed at said one surface for intermittently moving the escalator during servicing by actuation thereof when said one plane is exposed upon swinging said flap out of the escalator,
means for monitoring the escalator,
said second actuating means of said actuating elements and said monitoring means are operatively fastened on the rear side of said flap at said one surface, and
said push-button at said another surface cooperating with a respective one of said second actuating means of said actuating elements.

4,360,079
SPOT-TYPE DISC BRAKE

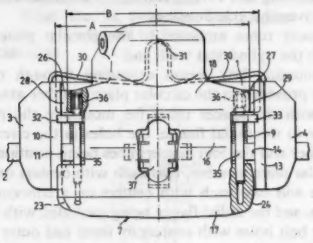
Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 109,390, Jan. 3, 1980, abandoned. This application Jan. 13, 1982, Ser. No. 339,038

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1979, 2904118

Int. Cl.³ F16D 65/02

U.S. Cl. 188—73.34 **13 Claims**



1. A spot-type disc brake comprising:

a brake support member disposed adjacent a brake disc having circumferentially spaced guiding portions disposed adjacent the circumference of and straddling said disc, said guiding portions slidably guiding at least a first brake shoe adjacent one side of said disc parallel to a rotational axis of said disc, supporting said first brake shoe in a circumferential direction, slidably guiding a brake caliper embracing said disc parallel to said axis and supporting said brake caliper in a radial direction, said caliper having at least a first leg adjacent said first brake shoe abutting each of said guiding portions only in a radially outward direction and said first brake shoe having portions abutting each of said guiding portions only in a radially inward direction; and

detachable holding means extending between said first leg and a second leg of said caliper disposed on the opposite side of said disc from said first brake shoe and through said portions of said first brake shoe, said holding means, said first leg in its relationship with said guiding portions and said portions of said first brake shoe in its relationship with said guiding portions cooperating to connect said brake caliper to said support member prior to detachment of said holding means, the spacing between said circumferentially spaced guiding portions being constructed and arranged such that following only detachment of said holding means, said brake caliper may slide relative to said support member in a circumferential direction until it is disengaged from one of said guiding portions enabling removal thereof from said support member in a radial direction by pivoting around an axis parallel to said axis at the other of said guiding portions, said holding means providing a positive engagement in said circumferential direction between said brake caliper and said first brake shoe.

4,360,080
CALIPER BRAKE STRUCTURE TO FACILITATE CHANGING OF BRAKE ELEMENTS

Koichi Tamura, Tokyo, Japan, assignor to Tokico Ltd., Kawasaki, Japan

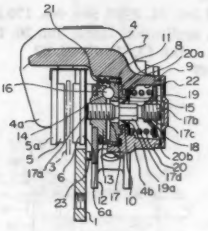
Filed Nov. 12, 1980, Ser. No. 205,979

Claims priority, application Japan, Nov. 19, 1979, 54-160033[U]

Int. Cl.³ F16D 65/14

U.S. Cl. 188—73.33 **3 Claims**

1. A disc brake comprising: a stationary member adapted to be mounted on a vehicle on one side of a rotational disc; a caliper having a main body portion slidably mounted on the stationary member and having an arm portion straddling the circumferential edge of the disc; a pair of friction pads provided on opposite sides of the disc; a pin means secured to the stationary member and extending to the other side of the disc from the stationary member having one of said friction pads slidably mounted thereon on the other side of the disc, said main body portion of the caliper being movable toward the stationary member for forming a space between the arm portion and said friction pad through which said friction pad can be dismounted from the pin means; a brake actuating mechanism mounted on the main body portion of the caliper and including an actuating lever, said actuating lever being rotatable between a non-actuating position and an actuating position in a plane perpendicular to the axis of the disc and being



displaceable toward the stationary member during actuation of the brake, the stationary member and the actuating lever having surfaces spaced in the direction of the axis of the disc; and a projection on one of said opposed surfaces and projecting toward the other surface and opposed to and abuttable against the other surface when said actuating lever is in the non-actuating position for preventing the main body portion of the caliper from being displaced toward the stationary member in the non-actuated condition of the brake for forming said space, and not opposed when said actuating lever is in the actuating position for allowing displacement toward said stationary member when said actuating lever is in the actuating position, whereby the friction pad cannot be dismounted from the pin when said actuating lever is in the non-actuating position.

4,360,081
DISC BRAKE

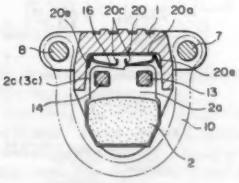
Hiroshi Ito, Kawasaki, and Koichi Tamura, Tokyo, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Jul. 21, 1980, Ser. No. 170,875

Claims priority, application Japan, Jul. 20, 1979, 54/93117

Int. Cl.³ F16D 65/02

U.S. Cl. 188—73.38 **4 Claims**



1. A disc brake including a pair of friction pad means disposed on opposite sides of a rotatable disc, a caliper straddling a portion of the circumference of the disc and incorporating therein an actuator for applying the friction pad means against the disc, a stationary holder having said caliper slidably mounted thereon, and a pad spring interposed between the caliper and the friction pad means for biasing the friction pad

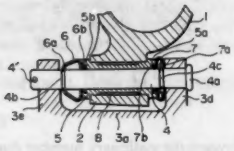
means in the radially inward direction with respect to the disc, said pad spring comprising two engaging portions which respectively extend in the direction of the axis of the disc for engaging with respective friction pad means, said two engaging portions being deflectable independently of each other, and said engaging portions and said pad means having shapes for causing one of said engaging portions to engage only one of said pad means and the other of the engaging portions to engage only the other of said pad means.

4,360,082

DISC BRAKE

Tetsuo Haraikawa, Funabashi; Hiroshi Ito, Kawasaki, and Koichi Tamura, Tokyo, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Jul. 21, 1980, Ser. No. 170,874
Claims priority, application Japan, Jul. 20, 1979, 54-92182
Int. Cl.³ F16D *65/02*
U.S. Cl. 188—73.45 **5 Claims**



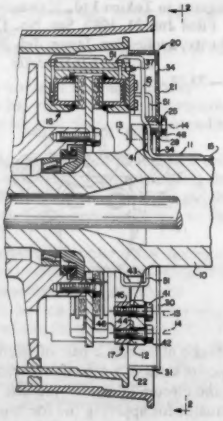
1. A disc brake comprising: a caliper member; a stationary member on which said caliper member is slidably supported; at least one pin provided on one of said members; and a guide on the other of said members and in which said pin is slidably supported for axial sliding movement in said guide, said guide being removably mounted on said other member for displacement relative to said other member in a direction transverse to the axis of said pin while said pin remains in said guide.

4,360,083

DISC BRAKE PROTECTIVE COVER PLATE

Roland E. Weisman, Wilmot, Wis., assignor to International Harvester Co., Chicago, Ill.

Filed Apr. 24, 1981, Ser. No. 257,282
Int. Cl.³ F16D *65/00*
U.S. Cl. 188—218 A **4 Claims**



1. In a tractor loaded vehicle having wheels equipped with multiple air-over-hydraulic, external dry caliper disc brake units, wherein two disc brake units are fluid connected to a main disc brake unit by tubing extending along an external side of a radial brake unit mounting flange on a wheel axle housing and each brake unit having brake fluid bleeder means for bleeding hydraulic brake fluid from the units, a disc brake protective cover comprising:

a circular flat plate member having a cylindrical wall projecting into a hub region of the wheel and surrounding the three disc brake units mounted to the radial flange on the wheel axle housing, the circular plate member having a diametrically extending slot cutting through the cylindrical wall and mounted over the axle housing;

four spacer tubes mounted to the circular plate member inside the cylindrical wall; and

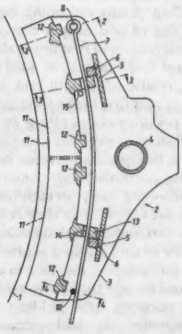
four mounting bolt means extending through respective holes provided in the circular plate member axially aligning with the spacer tubes for mounting the protective cover to the radial flange, the holes in the circular plate member and the four spacer tubes being positioned to the circular plate member, two each with centers on an inner circle and two each with centers on a concentric outer circle, and the radial flange being provided with inner and outer bolt holes with centers on inner and outer bolt hole circles coinciding with the inner and outer circles of the circular plate member and having four bolt holes axially aligning on the centers of the circular plate member holes and associated spacer tubes.

4,360,084

BLOCK BRAKE ASSEMBLY FOR THE WHEEL OF A RAILWAY VEHICLE

Sven Stjerna, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Aug. 27, 1980, Ser. No. 181,726
Claims priority, application Sweden, Sep. 21, 1979, 7907641
Int. Cl.³ F16D *65/04*
U.S. Cl. 188—242 **1 Claim**



1. In a brake block assembly for a wheel of a railway vehicle, including a holder having at least one replaceable brake block, the assembly being pivotable about an axis parallel to the wheel axle and being displaceable toward the wheel so that the brake block is pressed against the periphery of the wheel when the brake is engaged, the improvement wherein said holder comprises a pair of spaced side members, said brake block having guide lugs and attaching lugs thereon projecting between said members, a leaf spring disposed between said members and being pivotably mounted at one end to said members, said attaching lugs having transverse openings therein and said spring extending through said openings for retaining said block against said holder and for pivoting said block away from and toward said holder during removal and replacement of said block, a removable lock pin on said side members bearing

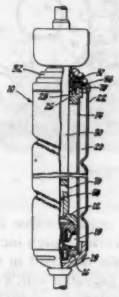
against an opposite end of said spring for locking said brake block against said side members, a pair of stop elements mounted between said side members and bearing against outer sides of a pair of said lugs for preventing tangential displacement of said block brake relative to said side members.

4,360,085

SHOCK ABSORBER WITH DEFLECTOR FOR HIGH PRESSURE REBOUND OIL

Joseph P. Pendergast, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1980, Ser. No. 209,963
Int. Cl.³ F16F 9/36
U.S. Cl. 188—315 **3 Claims**



1. A hydraulic shock absorber comprising a cylinder tube having a hydraulic shock absorber oil therein, a reservoir tube spaced from said cylinder tube to provide a reservoir for shock absorber oil, a valved piston slidably mounted in said cylinder tube, base valve means operatively supported at one end of said cylinder tube for controlling the flow of oil to and from said cylinder tube, piston rod guide means disposed at the other end of the cylinder tube having an outer wall with a radial opening communicating with said reservoir, a piston rod extending from said piston through said rod guide means, annular oil deflector means mounted within the confines of said rod guide means aligned with said radial opening and directly contacting said piston rod for deflecting oil pressurized on the rebound stroke of said piston moving outwardly in said cylinder tube through said radial opening into said reservoir and low pressure seal means spaced from and disposed outwardly of said deflector means to contact said piston rod to block the escape of fluid from said shock absorber.

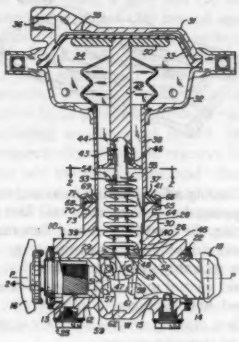
4,360,086

BRAKE ACTUATOR ASSEMBLY

Richard G. Bond, Union Lake, and David J. Edwards, Utica, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 18, 1980, Ser. No. 179,413
Int. Cl.³ F16D 65/30
U.S. Cl. 188—343 **6 Claims**

1. In a brake assembly of the type wherein a reciprocating wedge actuator projects into an actuator housing containing two oppositely slidable brake shoe associated plungers disposed in aligned bores having a common axis and a fluid pressure motor unit has a tubular support by which it is adapted to be mounted on said housing with said wedge actuator extending between a fluid pressure responsive element of said motor and the inner ends of said plungers, said housing having a boss including a bore, the improvement that comprises first flange means at the extremity of said boss concentric with said bore, second flange means spaced a predetermined distance from the end of said tubular support and concentric therewith, at least one of said flange means comprising a plurality of circumferentially spaced lugs, a split lock ring having a circumferentially extending base and means extending radially inward from each edge of said base, at least one of said means extending radially inward from said base comprising a plurality of tabs at spaced intervals. along said base, said lugs and said tabs being dimensioned and spaced to pass each other axially when said one flange means is concentric with said ring and said lugs are



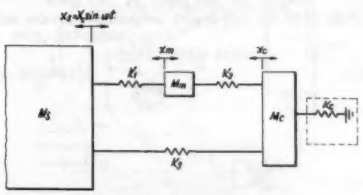
aligned with the spaces between said tabs while permitting independent rotation of said lock ring and said second flange means relative to said first flange means, and to prevent axial movement between said one flange means and said ring when said lugs are aligned with said tabs, and means for drawing said tabs into contact with said lugs to secure said support to said housing.

4,360,087

SUSPENSION AND VIBRATION ISOLATION SYSTEM FOR A LINEAR RECIPROCATING MACHINE

Peter Curwen, Ballston Spa, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 27, 1980, Ser. No. 153,839
Int. Cl.³ F16F 7/10
U.S. Cl. 188—379 **16 Claims**



1. A vibration isolation system for a machine reciprocating in a "lateral" direction comprising:

a frame for supporting the machine relative to ground;

a suspension system, suspending said machine from said frame and including functionally operating components of said machine providing a resilient lateral support means coupled between said frame and the reciprocating machine;

a counterbalance mass positioned at a predetermined point on one or more selected components of said resilient lateral support means, wherein, in response to forces thereupon resulting from reciprocating movement of the machine, an antiphase movement of the counterbalance mass results in a substantially reduced resultant force exerted upon said frame.

4,360,088

DYNAMIC REBOUND-RESONANCE SUPPRESSION

Jay S. Amble, 1117 W. Rosemonte Dr., Phoenix, Ariz. 85027

Filed Jun. 3, 1980, Ser. No. 156,115
Int. Cl.[3] F16F 7/10
U.S. Cl. 188—380 15 Claims

1. In a system having a first moving mass and stopping means for abruptly stopping the movement of said first moving mass, means for reducing the tendency of said first moving mass to rebound from said stopping means comprising;

a second mass movably coupled to said first moving mass such that said second mass will move with said first moving mass and will maintain its motion due to its inertia when said first moving mass is abruptly stopped by application of said stopping means;

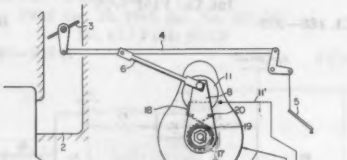
means for coupling the inertial force of the maintained movement of said second mass to said first moving mass so as to continue to impell said first moving mass against said stopping means, said inertial force acting counter to the rebound reaction force resulting from application of said stopping means to said first moving mass.

4,360,089

ELECTRIC ACTUATOR PROVIDED WITH A BRAKE

Takeshi Matsui, Aichi, and Takaharu Idogaki, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 3, 1980, Ser. No. 156,088
Claims priority, application Japan, Jul. 4, 1979, 54/84834
Int. Cl.[3] B60K 41/28
U.S. Cl. 192—2 5 Claims



1. An electric actuator having an output member secured to an output shaft and adapted to be alternatively driven either by means of an electric motor or by external operating means, comprising:

speed reduction gear means for reducing the rotational speed of said electric motor;

differential gear means interposed between said output shaft and said speed reduction gear means and having first and second gears which perform differential rotation;

a brake assembly operatively connected to the second gear of said differential gear means;

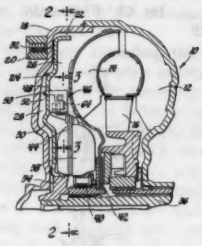
wherein when the brake assembly is operative to stop the rotation of said second gear the rotation of said electric motor is transmitted to the output shaft via said speed reduction gear means and said differential gear means, and when said brake assembly is inoperative to free said second gear the output member can be freely operated by said external operating means.

4,360,090

TORQUE REVERSAL CONTROL VALVE FOR A TORQUE CONVERTER CLUTCH

Quinby E. Wonn, Farmington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1980, Ser. No. 199,085
Int. Cl.[3] F16D 39/00; F16H 45/02
U.S. Cl. 192—3.3 3 Claims



1. A torque reversal control valve for a torque converter clutch, said torque converter clutch including a fluid pressure chamber, a pressure plate disposed in said pressure chamber and being selectively engageable with a torque converter input member, and a vibration damper means for resiliently connecting said pressure plate with a torque converter output member; said torque converter clutch being operable in response to fluid pressure in said pressure chamber to transmit torque; said control valve comprising a body portion secured to said pressure plate, an aperture in said pressure plate, a slide member disposed in said body portion, resilient means for urging said slide member to close said aperture and actuator means operatively connected with said slide member and being contacted by said damper means upon a change in the direction of torque transmission by said torque converter clutch to move said slide member to open said aperture to effect a reduction in the fluid pressure in said pressure chamber for thereby reducing the torque capacity of said torque converter clutch.

4,360,091

TRACTOR TRANSMISSION

Kenzo Sada, and Mitsuo Watashi, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Aug. 28, 1979, Ser. No. 70,462
Claims priority, application Japan, Sep. 4, 1978, 53/122262[U]
Int. Cl.[3] F16D 67/00, 57/02; F16H 37/06
U.S. Cl. 192—4 B 5 Claims

1. A tractor transmission comprising:

an input shaft (3) which receives driving power from an engine;

a gear type speed change mechanism 15 including a traveling system transmission shaft 14, said gear type speed change mechanism 15 operatively connecting said transmission shaft (14) to said input shaft (3), said speed change mechanism (15) including a transmission gear (15*a*) fixed to said input shaft (3) for operating said transmission shaft (14), said transmission gear 15*a* having a diameter which is larger than any other gear of said input shaft (3);

a power takeoff system transmission shaft (16) disposed below said input shaft (3);

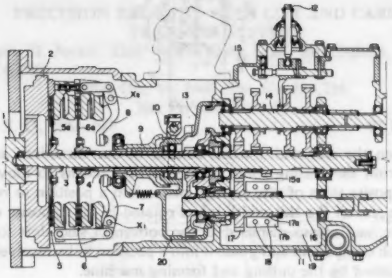
gear means for rotating said power takeoff system transmission shaft 16;

a transmission case 11 housing and supporting therein said input shaft (3), said traveling system transmission shaft (14) and said power takeoff system transmission shaft (16),

said transmission case **11** including a lubricating oil reservoir **(19)** in a lower portion thereof relative to said transmission shaft **(16)**;

said transmission gear **(15*a*)** being disposed on said input shaft **(3)** adjacent one wall defining said oil reservoir **(19)**;

a freely rotatable gear **(17)** mounted on said power takeoff system transmission shaft **(16)**, said freely rotatable gear **17** being in constant mesh with said transmission gear **(15*a*)** and disposed adjacent said one wall defining said oil reservoir **(19)**, said gear **17** including a boss portion **(17*a*)** disposed on said gear **(17)** on a side opposite from said one wall defining said reservoir; and



a plurality of axially aligned substantially radially extending blades **(17*b*)** mounted perepherially on said boss portion **(17*a*)** in spaced relationship; and

positioned to be entirely immersed in a lubricating oil in said reservoir **(19)**, each of said blades including openings therein through which oil may flow;

whereby spacings between said blades **(17*b*)** provide openings to any lubricating oil in at least one direction parallel to a rotational axis of said blades and in a direction away from said one wall defining said oil reservoir **(19)**.

4,360,092

GEARSHIFT METHOD AND APPARATUS

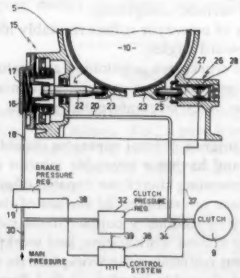
Alfred Müller, Leonberg, and Joseph Sauer, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,522

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913824

Int. Cl.³ F16D *67/04*; F16H *57/10*

U.S. Cl. 192—12 C **1 Claim**



1. In an automatic transmission having planetary gearing having a drive member **(1)**, a driven member **(2)**, a first intermediate member **(3)**, means including a hydraulically operated clutch **(9)** for coupling said drive member, said driven member and said first intermediate member so as to prevent relative rotation therebetween, means comprising a brake band **(4)** having a first and a second end coupling at its respective ends and disposed for applying a brake force to said first intermediate member and also comprising a hydraulic piston **(16)** for applying brake force to said first end coupling in response to the difference in pressures of a pressure medium respectively applied at an actuating side and at a release side thereof, means **(18,20)** for applying hydraulic fluid to said activating and release sides of said piston, a gear box **(5)** for housing said transmission, and sensor means **(26)** braced against said transmission and against said second end coupling of said brake band **(4)** for receiving a reactive force varying in dependence upon said brake force and the direction of rotation of said first intermediate member and for furnishing a threshold signal when said reactive force passes a threshold value, said sensor means **(26)** including an electrical switch having first and second states respectively when said reactive force is less than and greater than said threshold value, and wherein said clutch means is disengaged and said brake band applies a maximum brake force to said first intermediate member creating a reactive force substantially exceeding said threshold value when said transmission is in a first gear and said brake band applies a minimum force to said first intermediate member when said transmission is in a second gear:

apparatus for generating a freewheel signal when the torque exerted by said first intermediate member is approximately equal to zero during shift in either direction between said first and second gear, comprising regulator means **(32,34)** for applying hydralic fluid simultaneously to said release side of said piston **(16)** and to said hydraulic clutch **(9)** for engaging said clutch at a predetermined rate, thereby decreasing said torque of said first intermediate member, and for simultaneously decreasing said brake force applied to said first intermediate member while maintaining sufficient brake force to prevent rotation of the latter and at a rate decreasing said brake force at a sufficient rate to enable said sensor means to furnish said threshold signal in response to a change of direction of said torque of said first intermediate member, whereby said threshold signal constitutes said freewheel signal.

4,360,093

ONE-WAY CLUTCH

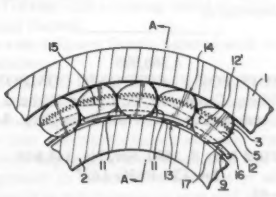
Shozo Wakabayashi, and Kinzo Narita, both of Daito, Japan, assignors to Tsubakimoto-Morse Co., Ltd., Osaka, Japan

Filed Oct. 20, 1980, Ser. No. 198,420

Claims priority, application Japan, Oct. 29, 1979, 54-138726; Apr. 7, 1980, 55-044566

Int. Cl.³ F16D *41/07*

U.S. Cl. 192—41 A **2 Claims**



1. In a one-way clutch comprising a plurality of sprags annularly inserted between outer and inner rings, comprising the improvement wherein the sprag has a groove formed therein substantially midway between the sides thereof, a garter spring fitted in the groove to urge the sprag toward an engaging direction, an internal surface of the sprag which is shaped so that one of the annularly disposed sprags is continually held in contact with another, an annular retainer comprising a wire rod which is alternately U-shaped to form an axially extending part and a circumferentially extending part to hold

the sprag between the axially extending part and the garter spring, and a pair of annular side plates adapted to be inserted between the circumferentially extending part and both sides of the sprag, the annular side plate having a recess in a boundary thereof in which the axially extending part of the retainer fits to prevent the motion thereof.

4,360,094

GEAR STRUCTURE FOR A MANUAL TRANSMISSION FOR AN AUTOMOBILE

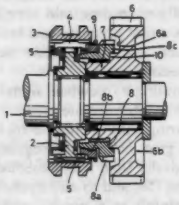
Kazuhito Ikemoto; Nobuaki Katayama; Yukio Terakura, all of Toyota, and Kan Sasaki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 9, 1980, Ser. No. 214,764

Claims priority, application Japan, Aug. 20, 1980, 55-118556[U]

Int. Cl.³ F16D *23/06*

U.S. Cl. 192—53 F **3 Claims**



1. In combination with a vehicular transmission having a shaft rotatably supported in a transmission case, a clutch hub rotatable with said shaft and having a spline on its outer periphery, a clutch hub sleeve being splinedly engaged with said spline of said clutch hub and movable in its axial direction by shifting operation of said transmission, a speed change gear freely rotatably mounted on said shaft and having a boss contacting said clutch hub, a gear spline formed independently of said speed change gear and being fixed on said boss of said speed change gear, an annular depression defined in said speed change gear, said gear spline being annular and comprising gear teeth on its radially outer periphery, said gear spline being positioned between said clutch hub and said speed change gear, the radially outer end of the side of said gear spline facing said speed change gear and projecting axially outwardly beyond the radially inner end of that side and extending axially into said depression, said teeth being selectively engageable and driven by said clutch hub sleeve and extending axially from one end thereof external of said speed change gear into said annular depression.

4,360,095

FEED CHUTE FOR ELECTRONIC COMPONENTS

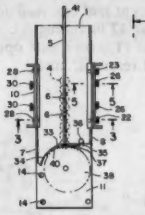
Wilbur A. Baldwin, Centerport, N.Y., and Richard Silverman, Clark, N.J., assignors to Roto Form Sales Corp., Lake Grove, N.Y.

Filed May 8, 1980, Ser. No. 147,844

Int. Cl.³ B65G *1/02*

U.S. Cl. 193—40 **2 Claims**

1. A chute for feeding electronic components having bodies and axial wire leads into a machine for cutting and forming said leads into the desired size and shape comprising in combination, a pair of spaced apart substantially flat parallel plates defining therebetween a chamber for the bodies of the electronic components; said plates each having an elongated slot extending along the length thereof for receiving and guiding the axial wire leads of said components; means for adjusting the distance between the plates to accommodate components having varying lengths; means for adjusting the width of the slots to accommodate axial leads having varying diameters comprising means for mounting one side of each plate in a fixed position; means for mounting the opposite side of each plate for movement relative to the first side of each plate; resilient means for biasing said opposite side of each plate into a position to reduce the size of said slots; and a plurality of adjustment screws connected to said opposite side of the parallel plates adapted to overcome the biasing force of the resilient means to



open the slot width when rotated in one direction, and to permit the biasing force of the resilient means to move the opposite sides of said parallel plates into a position to reduce the size of the slot width when rotated in the opposite direction; and means disposed at the bottom of said slots to stop each component and guide it into a position to be received and retained by the cutting and forming machine.

4,360,096

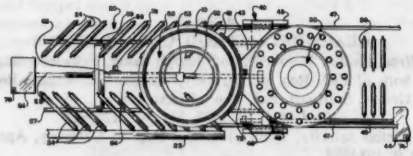
AUTOMATIC CENTERING SYSTEM AND METHOD FOR USING SAME WITH POST-INFLATOR APPARATUS

Harold S. Rocco, 4271 Darrow Rd., Stow, Ohio 44224, and Joseph C. Smith, Greentown, Ohio, assignors to Harold S. Rocco, Stow, Ohio

Filed Aug. 18, 1980, Ser. No. 178,855

Int. Cl.³ B65G *49/00*

U.S. Cl. 198—345 **14 Claims**



1. An automatic workpiece centering device on a frame between two work stations, the workpiece being of annular shape and having an inner circumferential surface and an outer circumferential surface, comprising:

(a) a plurality of conveyor rollers rotatably mounted on the frame at inward angles;

(b) a movable workpiece positioning apparatus mounted on the frame and having a curvilinear contact surface to contact the outer circumferential surface of the workpiece;

(c) a slidable interior control apparatus slidably mounted on the frame and having a pivotable interior control finger pivotally extending therefrom capable of communication with the inner circumferential surface of the workpiece;

(d) a plurality of stationary contact items mounted on the frame at the second work station, said workpiece positioning apparatus restraining the workpiece on said conveyor rollers, said pivotable interior control finger controlling the annular workpiece in a forward direction to the second work station, and said stationary contact items maintaining the workpiece at the work station in an accurately centered position, wherein said slidable interior control apparatus comprises an interior control motor means for powering said apparatus, a ball screw, at least one threaded bracket, at least one roller bracket, a plurality of

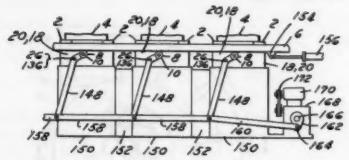
rollers, at least one rail, and an interior finger activation means for pivoting said interior control finger about a pivot point between horizontal and vertical positions; and said roller brackets interconnected with said threaded brackets, said motor means connected to said ball screw rotatable within said threaded brackets interconnected with said roller brackets and said rollers on said roller brackets rotatable on said rails, such that said interior activation means and said interior control finger may travel along the frame in both directions of said rails between its home position and at the second work station.

4,360,097

PRECISION REGISTRY WITH LIFT AND CARRY TRANSFER SYSTEM

John H. Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010

Filed Oct. 14, 1980, Ser. No. 196,216
Int. Cl.³ B65G 47/00
U.S. Cl. 198—345 **13 Claims**



11. In a multiple station transfer machine in which workpieces are supported and located in pallets, and in which said pallets are progressively moved through the stations of said transfer machine by a lift and carry transfer means having a vertical lift means and a horizontal drive means, registry mechanisms for locating and clamping said pallets, each of which comprises:

(a) a registry frame,

(b) support means for said pallet on said registry frame,

(c) locating means on said registry frame to locate said pallet,

(d) clamping means on said registry frame to clamp said pallet to said support means,

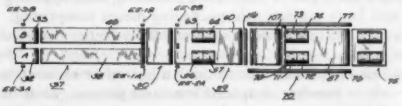
(e) rotatable actuating means on each said frame which is substantially integral with said lift means of said transfer means and to actuate in sequence said lift means to lower said transfer means and thereby lower said pallet to said support means, and thereafter to actuate said locating means to locate said pallet, and thereafter to actuate said clamping means to clamp said pallet to said support means.

4,360,098

INFEED CONVEYOR

John E. Nordstrom, Two Rivers, Wis., assignor to Barbara Ann Nordstrom, Two Rivers, Wis., a part interest

Filed Jul. 29, 1977, Ser. No. 820,053
Int. Cl.³ B65G 47/26
U.S. Cl. 198—419 **23 Claims**



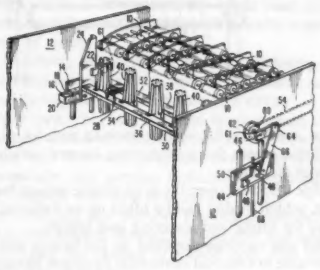
1. A conveyor system to supply paper rolls and like articles in synchronized sequence to a subsequent device at high speed, and capable of handling rolls of tissue and the like, comprising a low friction belt supply conveyor, a high friction belt squeezer conveyor having a lower belt and an upper belt arranged to receive products between said high friction belts, said squeezer conveyor having drive means to drive it at a first speed a little above the required average speed, and at a second speed a little below the required average speed, and first control means to switch said drive means from one said speed to the other in response to a timing signal derived from product position, a speedup conveyor operating at an average speed greater than the speed of the squeezer conveyor, a flight conveyor operating over a low friction stationary bed to deliver articles at high speed in exact synchronization to a subsequent device, and in which a backlog sensor senses the presence of conveyed articles at a location on the supply conveyor and initiates a signal enabling the squeezer conveyor to run only when conveyed articles are sensed at said location.

4,360,099

EGG TRANSFER APPARATUS

Lee H. Niederer, and Thomas O. Niederer, both of Titusville, N.J., assignors to Otto Niederer Sons, Inc., Pennington, N.J.

Filed Oct. 24, 1980, Ser. No. 200,120
Int. Cl.³ B65G 47/00
U.S. Cl. 198—424 **8 Claims**



1. An egg transfer apparatus, for the receiving of eggs from thereabove and the transporting vertically to a location therebelow, which comprises:

(a) a housing means;

(b) a carriage plate movably secured with respect to said housing means;

(c) a slide retaining means fixedly secured with respect to said carriage plate and defining a slide channel therein extending approximately horizontally and adapted to receive a horizontally movable member therein;

(d) a slide member movably secured within said slide channel of said slide retaining means to allow horizontal movement thereof;

(e) a cam follower fixedly secured with respect to said slide member;

(f) a cam arm mounted with respect to said housing means for rotational movement with respect thereto, said cam arm being mounted adjacent said cam follower;

(g) a cam roller mounted on said cam arm and being selectively engageable with respect to said cam follower responsive to rotational movement of said cam arm with respect to said housing to urge said slide member to move within said slide retaining means;

(h) a first bracket means fixedly secured with respect to said slide member and said cam follower to be movable therewith;

(i) a second bracket means fixedly secured with respect to said carriage plate to be movable therewith; and

(j) an egg holding means adapted to receive an egg from thereabove and gently deposit the egg at a location therebelow, said egg holding means comprising a first egg support member fixedly secured with respect to said first bracket means and a second egg support member fixedly

secured with respect to said second bracket means to selectively open and close said egg holding means responsive to horizontal movement of said slide member within said slide channel;

(k) a biasing means secured with said first bracket means and said second bracket means to bias them toward one another.

4,360,100

APPARATUS FOR SETTING FORMED ARTICLES

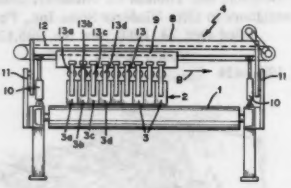
Hermann Kamphues, Ibbenbüren, Fed. Rep. of Germany, assignor to C. Keller GmbH und Co, KG, Ibbenbüren-Laggenbeck, Fed. Rep. of Germany

Filed Aug. 18, 1980, Ser. No. 178,811

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003644

Int. Cl.³ B65G *47/32*

U.S. Cl. 198—458 18 Claims



1. An apparatus for setting formed articles comprising a controllable means for transporting formed articles in a first horizontal direction;

a bridge disposed over the controllable means for transporting, which bridge can be lifted up or lowered down;

means for lifting and lowering said bridge;

at least one carriage disposed on the bridge and controlled movable in a second horizontal direction having a substantial component orthogonal to said first horizontal direction;

at least two individually operable grippers attached to said carriage and disposed adjacent and forming a row in said second horizontal direction for gripping the formed articles from the controllable means for transporting;

means for moving the grippers and the gripped formed articles in said second horizontal direction; and means for releasing the formed articles successively from the grippers at desired locations.

4,360,101

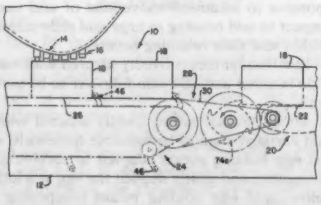
CASE FEED CONTROL FOR ARTICLE HANDLING APPARATUS

Robert W. McGill, Munroe Falls, and Michael E. Winiasz, Lorain, both of Ohio, assignors to A-T-O Inc., Willoughby, Ohio

Filed Feb. 21, 1978, Ser. No. 879,129

Int. Cl.³ B65G *47/31*

U.S. Cl. 198—461 10 Claims



7. A method of controlling the feeding of cases for bottles and similar articles comprising moving a stream of longitudinally abutted cases along a fixed path to a control area, increasing the speed of movement of a leading case at the control area, raising the trailing end of the leading case at such control area, retarding the speed of movement of the case first following said leading case until the leading case is advanced and spaced from the following case and, initially retarding the speed of movement of said leading case at the control area without stopping such case and then releasing the leading case for increased speed movement.

4,360,102

CONVEYING APPARATUS FOR USE IN MINERAL MINING

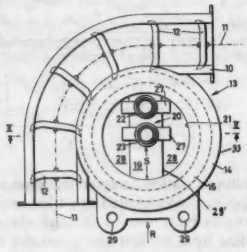
Klaus Beckmann, Lünen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Continuation of Ser. No. 7,795, Jan. 30, 1979, abandoned. This application Aug. 27, 1980, Ser. No. 181,805

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805431

Int. Cl.³ B65G *19/18;* E21D *23/00*

U.S. Cl. 198—729 11 Claims



1. In a conveying apparatus for use in mineral mining, said apparatus at least including a curvilinear channel section with a scraper-chain assembly movable along the channel section, the improvement comprising: a housing having a vertical opening extending therethrough, at least one roller rotatably surrounding said housing to contact and guide the scrapers of the scraper-chain assembly during passage along the channel section, and a support extending vertically through said opening, the support being braceable between the floor and the roof of a mine working and being displaceable within said opening independently of the housing and the channel section in a transverse direction relative to the bracing direction.

4,360,103

PACKAGE MEANS FOR PHOTOFLASH UNIT

Donald E. Armstrong, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 3, 1981, Ser. No. 250,822

Int. Cl.³ B65D *5/50, 73/00, 85/42*

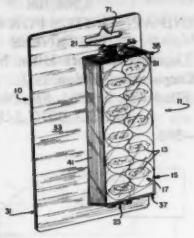
U.S. Cl. 206—482 10 Claims

1. Packaging means for a photoflash unit having a body portion and a pair of connectors extending form opposing ends of said body portion, said packaging means comprising:

a sheet member having a substantially planar front surface; and

a pair of foldable tabs forming a part of or secured to said sheet member at spaced locations thereon, each of said foldable tabs adapted for projecting from said sheet member to engage a respective one of said connectors of said photoflash unit and retain said unit against said substantially planar front surface of said sheet member, the front part of said body portion of said photoflash unit being uncovered to enable inspection thereof, each of said fold-

able tabs including a substantially planar main segment for engaging a respective one of said ends of said body portion of said photoflash unit from which said connector



extends during said retention and a tongue segment projecting from said main segment for engaging said connector to provide said retention against said sheet member.

4,360,104

UNIVERSAL STERILE CLOSED HOSE SYSTEM FOR RESPIRATION THERAPY APPARATUS

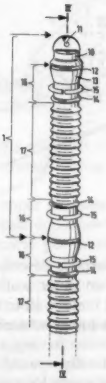
Volker Lang, Spitzwegstrasse 63, 8012 Ottobrunn, Fed. Rep. of Germany

Filed Aug. 21, 1980, Ser. No. 180,030

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1979, 2934916

Int. Cl.³ B65D *85/08, 85/62, 69/00*

U.S. Cl. 206—527 **7 Claims**



1. A closed sterile hose set for apparatus for artificial respiration and for respiration-assisting and aerosol therapies, comprising serially arranged plural tubular hose sections, each said section having an adapter at each end, for inter-connection of artificial respiration, respiration-assisting and aerosol therapy apparatus components, said sterile hose set further comprising a disconnect between each pair of adjacent hose sections and at least two terminal hose sections, each said terminal hose section being closed at one end and provided with a disconnect near said closed end.

4,360,105

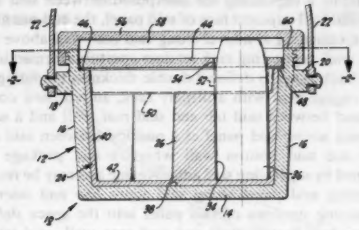
FOOD CONTAINER

Lavada G. Williams, 4023 Balfour Ave., Oakland, Calif. 94610

Filed Apr. 27, 1981, Ser. No. 257,713

Int. Cl.³ A45C *11/20*

U.S. Cl. 206—544 **8 Claims**



1. A food container comprising:

a. a receptacle having bottom and side portions forming a container of space;

b. a support within said receptacle having at least one partition forming at least a first and second cavity within said container of space;

c. a tray overlying said support, said tray enclosing said at least first and second cavities, said tray including an opening therethrough aligned with said first cavity;

d. a member overlying said tray and support, said member substantially enclosing said first and second cavities and enclosing said tray overlying said cavities in relation to said receptacle; said member including an opening therethrough aligned with said first cavity;

e. a cover overlying said member forming a chamber therebetween; said aligned openings of said tray and said member permitting the passage of a food item from said first cavity to said chamber.

4,360,106

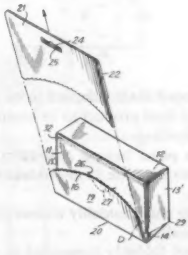
DISPLAY MOUNTABLE CONTAINER HAVING RECLOSEABLE FEATURE

James E. B. Irvine, North Plainfield, and J. Roy Parcels, Columbus, both of N.J., assignors to Youngs Drug Products Corporation, Piscataway, N.J.

Filed Apr. 13, 1981, Ser. No. 253,237

Int. Cl.³ B65D *5/54, 5/02*

U.S. Cl. 206—621 **3 Claims**



1. A reclosable package comprising an integral blank printed on one face, said package including an enclosed space in the general shape of a rectangular parallelepiped defined by front, rear, top and bottom walls, having said one face directed outwardly, each of said front and top walls being joined to others of said walls along two parallel fold lines, said rear wall being connected to said top wall along a single fold line and having

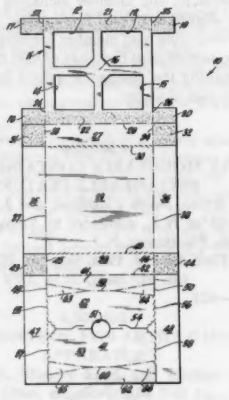
a downwardly directed free edge, a rear panel member joined to said bottom wall along a first fold line coincident with the rear margin thereof, said rear panel extending upwardly parallel to said rear wall and therebeyond, a slit formed in said rear wall defining a tongue including a tip directed toward said bottom wall, said rear panel being folded forwardly toward said rear wall along a second line parallel to said first fold line to define a depending tab interposed between said rear wall and the wall adjacent face of said panel, the end margin of said tab terminating at a level along said rear wall above said bottom wall, registering rack retainer apertures formed in said tab and back panel to define a double thickness mounting support for engagement with a display rack, an adhesive connection formed between said tab and said rear wall and a score line formed across said panel at a position between said adhesive line and said bottom wall whereby said package may be opened by separating said adhesive line and may be reclosed by severing said panel along said score line and inserting the remaining portions of said panel into the space defined between said bottom wall and said rear wall, said tab in said reclosed condition of said package being disposed within said slit with said tongue, engaging one surface of said tab and said rear wall engaging the other surface of said tab, thereby frictionally to retain said tab in said reclosed position.

4,360,107

CARTON BLANK AND CARTON FOR PIZZA

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 26, 1980, Ser. No. 191,345
Int. Cl.³ B65D 5/54
U.S. Cl. 206—626 **12 Claims**



1. A paperboard blank adapted to be erected into a carton for containing a food product to be heated while in the carton, said blank comprising:

(a) a bottom panel having a plurality of openings therein operative to vent the food product while being heated in the carton;

(b) a first side panel foldably connected to one edge of said bottom panel;

(c) a top panel foldably connected to one edge of said first side panel;

(d) a second side panel foldably connected to one edge of said top panel;

(e) a closure panel foldably connected to one edge of said second side panel so as to overlie said bottom panel openings when the carton is erected; and

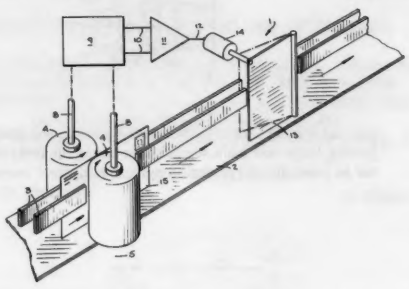
(f) a plurality of support panels formed in said closure panel, said support panels being foldably connected to marginal portions of said closure panel by a plurality of fold lines forming triangular shaped fold areas.

4,360,108

METHOD AND APPARATUS FOR CHECKING LETTER THICKNESS

Emanuel N. Logothetis, Short Hills, N.J., assignor to Joule' Technical Corporation, Union, N.J.

Filed Jan. 5, 1981, Ser. No. 222,390
Int. Cl.³ B07C 5/34
U.S. Cl. 209—598 **13 Claims**



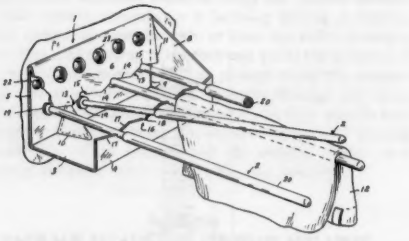
1. Envelope inspection means comprising the comination of inflated roller means, means for passing the envelopes past the roller means whereby the roller pressure varies with the envelope shape, and means for generating a control signal in accordance with the roller pressure change.

4,360,109

DEVICE FOR SUPPORTING WEARING APPAREL

Larry E. Kurtz, 7433 Popp Rd., Fort Wayne, Ind. 46825

Filed Mar. 24, 1980, Ser. No. 133,502
Int. Cl.³ A47F 5/08
U.S. Cl. 211—100 **7 Claims**



1. A device for the purpose described comprising an elongated structure having an inner wall and an upturned wall disposed in front of said inner wall in spaced relation thereto, said inner wall having a lower substantially planar longitudinally extending continuation having a marginal edge portion provided with longitudinally spaced receiving means, said upturned wall having an upper longitudinally extending marginal edge portion provided with second longitudinally spaced receiving means which are respectively disposed opposite to said firstmentioned receiving means, the arrangement being such that one or more elongated headed rods can be readily manipulated so that their inner extremities will engage certain of said receiving means and said upturned wall constitutes a fulcrum for positioning one or more of said headed rods to locate their outer extremities substantially horizontally, perpendicular and forwardly of said upturned wall for supporting one or more articles, at least each of said certain of said first-

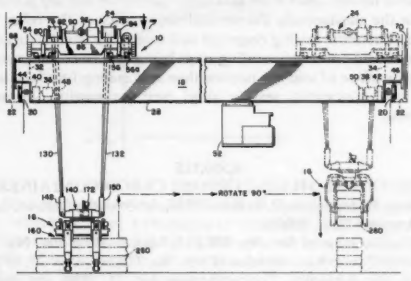
mentioned receiving means comprises an inset seat which will receive an inner extremity of a rod and relatively long straight edges which converge upwardly into the seat and may be selectively engaged by an inner extremity whereby to facilitate its entry into the seat and each of said second receiving means comprises an inset seat and a pair of long straight edges which converge downwardly into said seat, and said heads of such rods being adapted for disposition between said inner wall and its continuation which serve as abutments to limit rear and forward movement of such rods when they are positioned in aligned pairs of seats.

4,360,110

POSITIVE GRIP LIFTING MECHANISM

Earl H. Sigman, and Timothy E. Abblett, both of Alliance, Ohio, assignors to AMCA International Corporation, Hanover, N.H.

Filed Aug. 18, 1980, Ser. No. 178,887
Int. Cl.³ B66C *7/16, 13/50*
U.S. Cl. 212—159 **30 Claims**



1. A tong for use in lifting articles such as aluminum or steel ingots and the like comprising

an elongated leg,

a pivot member fixedly attached to and depending from said leg, said pivot member having an upper portion and a lower portion,

an upper link, first upper pin means for pivotally attaching said upper link to said upper portion of said pivot member,

a lower link, first lower pin means for pivotally attaching said lower link to said lower portion of said pivot member,

a tong bit having an upper portion disposed outwardly of said pivot member and a lower portion, second upper pin means for pivotally attaching said upper link to said upper portion of said tong bit, second lower pin means for pivotally attaching said lower link to said lower portion of said tong bit, said second upper pin means being positioned outwardly of said first upper pin means, said second lower pin means being positioned outwardly of said first lower pin means, said lower portion of said tong bit extending under said pivot member and having an innermost end projecting inwardly of said pivot member, said innermost end including means for penetratingly engaging a side of the article to be lifted,

and

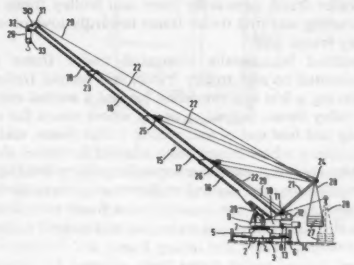
means for resiliently restraining said tong bit against said pivot member.

4,360,111

CRANE WITH TELESCOPIC JIB

Hans Weiskopf, Hilden, Fed. Rep. of Germany, assignor to Leo Gottwald KG, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 29, 1980, Ser. No. 144,925
Claims priority, application Fed. Rep. of Germany, May 3, 1979, 2917829
Int. Cl.³ B66C *23/76*
U.S. Cl. 212—196 **12 Claims**



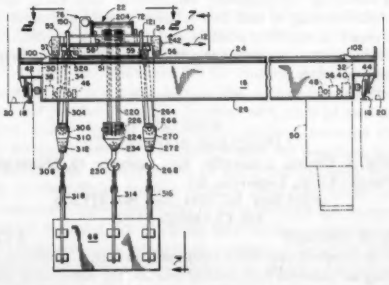
1. In a mobile crane including a carriage, an upper chassis, means mounting said upper chassis on said carriage for rotation about an upright axis, a telescopic jib, means pivotally mounting said telescopic jib on said upper chassis for luffing movement about a substantially horizontal axis, a hoist rope, means for winding in and unwinding said hoist rope, a counterweight and means mounting said counterweight for counterbalancing said jib and loads carried from said jib by said hoist rope, the improvement comprising a holding and raising device mounted on said upper chassis, said holding and raising device being operative to pick up from the ground an additional removable counterweight and to hold said counterweight, and means connecting said holding and raising device to said telescopic jib for pivoting said holding and raising device relative to said jib and for lowering and raising said device for picking up said additional counterweight.

4,360,112

TWO-WAY EXTENDABLE CRANE TROLLEY

Bruce L. Brewer, Alliance, and Brooks E. Weingart, Sebring, both of Ohio, assignors to AMCA International Corporation, Hanover, N.H.

Filed Sep. 26, 1980, Ser. No. 191,280
Int. Cl.³ B66C *9/02*
U.S. Cl. 212—206 **32 Claims**



1. A two-way extendable trolley comprising

a trolley frame and wheel means for supporting said trolley frame, said wheel means being adapted for travel along primary track means, means for driving said wheel means

along said primary track means, hoisting means mounted on said trolley frame,

a first horizontally elongated trailer frame slidably mounted on said trolley frame, said first trailer frame having a first end extending beyond a first end of said trolley frame, first auxiliary wheel means for supporting said first end of said first trailer frame, said first auxiliary wheel means being adapted for travel along said primary track means, a first auxiliary hoisting means mounted on said first trailer frame, and means for horizontally extending said first trailer frame outwardly from said trolley frame and retracting said first trailer frame inwardly toward said trolley frame, and

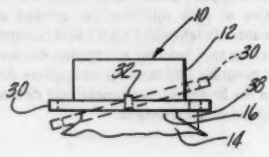
a second horizontally elongated trailer frame slidably mounted on said trolley frame, said second trailer frame having a first end extending beyond a second end of said trolley frame, second auxiliary wheel means for supporting said first end of said second trailer frame, said second auxiliary wheel means being adapted for travel along said primary track means, a second auxiliary hoisting means mounted on said second trailer frame, means for horizontally extending said second trailer frame outwardly from said trolley frame and retracting said second trailer frame inwardly toward said trolley frame, said first trailer frame and second trailer frame being adapted for extending in opposite directions for each other.

4,360,113

CHILD RESISTANT CONTAINER AND CAP ASSEMBLY

Edward Luker, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Jul. 20, 1981, Ser. No. 284,673
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—216 **10 Claims**



1. A child resistant container and cap assembly requiring a twist action of the cap relative to the container to open and close the container, said assembly comprising: a cylindrical cap, a curved lock member extending around the exterior of said cap in spaced relation thereto, pivot means supporting said lock member relative to said cap for limited tilting movement of said lock member from a first to a second position relative to said cap, a pair of abutment elements on said lock member and said container, respectively, engageable with each other to prevent twisting of said cap relative to said container when said ring is in said first position and permitting twisting of said cap relative to said container when said lock member is in said second position.

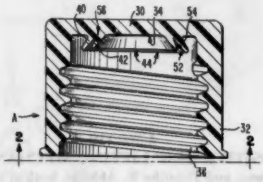
4,360,114

LINERLESS BOTTLE CAP

Phillip J. Owens, Louisville, Ky., assignor to Thoroughbred Plastics Corp., Louisville, Ky.

Filed Nov. 16, 1981, Ser. No. 321,976
Int. Cl.³ B65D *53/00*
U.S. Cl. 215—329 **8 Claims**

1. A linerless cap for a container including a tubular neck having an external constructed portion for removable attachment of a cap thereto and terminating in an annular rim about the incipient opening of the mouth thereof, said linerless cap including a disk-like top portion having a tubular skirt perimetrically depending therefrom and defining an inner surface thereof confrontable to and across the annular rim of the neck of the container, said tubular skirt including retaining means cooperatively engageable with the external constructed portion of the neck of the container for removable attachment of said cap to the neck of the container, said top portion including a plurality of resilient concentric sealing rings depending from said inner surface of said top portion, each of said concentric sealing rings being of scalene cross section defining a sealing lip at the depending vertex thereof and having an axis of median depending attitude obliquely extending from said top portion to said sealing lip at an acute angle toward the inner diameter of said tubular skirt, said sealing lip of each said concentric sealing rings being substantially diametrically coplanar and



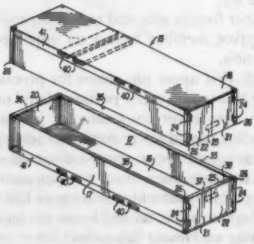
diametrically disposed for abutment with the annular rim of the neck of the container and of a substantially parallel diametric planarity to each other and to the inner surface of said top portion, the substantially diametrical coplanarity of said sealing lip of the outermost of said concentric sealing rings being spaced farther apart from said inner surface of said top portion than the substantially diametrical coplanarity of the other of said concentric sealing rings and said sealing lip of each successive of said concentric sealing rings being spaced closer to said inner surface of said top portion than said sealing lip of the one of said concentric sealing rings next outwardly adjacent thereto.

4,360,115

SECTIONAL MULTI-PURPOSE CARGO CONTAINER

George D. Saunders, P.O. Box 70026, Ambassador Station, Los Angeles, Calif. 90070

Continuation of Ser. No. 885,017, Mar. 9, 1978, Pat. No. 4,209,887, which is a division of Ser. No. 771,113, Feb. 23, 1977, Pat. No. 4,144,984. This application Jun. 24, 1980, Ser. No. 162,496
Int. Cl.³ B65D *21/02, 88/12*
U.S. Cl. 220—1.5 **14 Claims**



1. A shipping container of the type described comprising an open top unit and an open bottom skeletonized extension unit; said open top unit comprising parallel opposed longitudinal walls, parallel opposed end walls interconnecting said longitudinal walls, a rectangular floor member fixed to said walls and a vertical structural post at each vertical corner, each said structural post having a pair of hollow corner fittings rigidly attached thereto at its upper and lower aspects; said skeletonized unit comprising a pair of end post members and a longitudinal member detachably connecting said end post members,

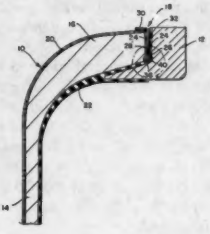
each said end post member being coextensive with a respective said vertical structural post and extending above a respective said end wall of said open top unit, said longitudinal member being spaced higher than and parallel to the tops of said longitudinal walls, said end post members each having two spaced apart further hollow corner fittings rigidly attached thereto on its upper aspect and on its lower aspect, and lock means releasable connecting said open top unit and said skeletonized unit, said lock means comprising means rigidly connecting each said fitting on an upper aspect of each said vertical structural post with a corresponding further fitting at the lower aspect of a respective end post member whereby said skeletonized unit is rigidly connected to said open top unit to form a composite container which is adapted to be lifted as a unit through said further corner fittings at the upper aspects of said end post members.

4,360,116

PARTIALLY SPLIT EXTERNAL BARRIER FOR COMPOSITE STRUCTURES

William D. Humphrey, Lincoln, Nebr., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 8, 1980, Ser. No. 214,109
Int. Cl.³ F17C *1/06*
U.S. Cl. 220—3 **17 Claims**



1. In a composite structure, such as a pressure vessel or the like, which includes a thickness of composite material terminating at a juncture with a fixed fitting or the like, and wherein said juncture is capable of separating under pressurization of said vessel, barrier means at said juncture comprising: a flexible barrier member disposed between said fixed fitting and the termination of said composite material at said juncture, said barrier member being sealed to said fixed fitting and said composite material to prevent moisture penetration around the barrier member, and said barrier member being split from the exterior thereof partially therethrough to accommodate any said separation at said juncture.

4,360,117

AUTOMATIC MEANS FOR EJECTING A PAYLOAD FROM ITS CONTAINER

Jacques Tardot, Gond Pontouvre, France, assignor to L'Etat Francais represente por le Deleque Ministeriel pour l'Armement, Paris, France

Filed May 12, 1980, Ser. No. 148,806
Claims priority, application France, May 10, 1979, 79 11825
Int. Cl.³ B65D *8/14*; B64D *1/08*
U.S. Cl. 220—4 R **5 Claims**

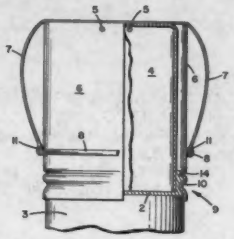
1. A container assembly for releasing its payload during free flight of the assembly, comprising:

a payload support having a cup-like structure comprising a base and a sidewall enclosing the perimeter of said base, said sidewall having an annular groove therein;

a tubular container having one end with a shape and size appropriate for fitting into said payload support;

a securing means for securing said end of said container in said payload support comprising a ring structure placed in said annular groove, at least two ties, each having one end secured to said tubular container, the other end of each of said ties being secured to said ring structure;

said ties being of such dimensions that they have sufficient



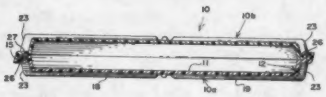
aerodynamic drag during free flight of said container assembly to displace said ring structure from said annular groove thereby permitting separation of said payload support from said tubular container.

4,360,118

SELF-MATING PIZZA PIE CONTAINER

James J. Stern, 115 Old Short Hills Rd., Apt. 343, Bldg. 32, West Orange, N.J. 07052

Filed Nov. 17, 1980, Ser. No. 207,374
Int. Cl.³ A45C *11/20*; B65D *1/24*
U.S. Cl. 220—4 E **5 Claims**



1. A self-mating pizza pie container comprising, in combination, a pair of identical, circular, lower and upper container half-sections, each having a flat circular body portion and a relatively short rim member defining, together with its body portion, a shallow recess, said rim member, at the inside thereof, defining an obtuse angle with respect to the inside of said circular body portion, the insides of said body portion and said rim having smooth surfaces, each container half-section having, in its peripheral rim member, opposed locating pin and locating recess means for the interfitting reception of the complemental locating pin and locating recess means of the companion half-section for relative rotational locating for closure of said two half-sections, each container half-section further having in its peripheral rim member resilient means adapted to interhookingly engage under rim member edge portions of the companion container half-section upon said half-sections being so relatively located and interfitted for closure, said interhookingly engaging means comprising a first, upwardly-extending, terminal rim portion integrally formed with each of said rim members, and a second downwardly-inclined terminal rim portion integrally formed with each of said rim members, said first terminal rim portions being of such configuration as to overlap in close-fitting nesting relation upon said lower and upper container half-sections being so interfitted for closure, said second terminal rim portions each further comprising a plurality outwardly-extending hook portions defining resilient, inwardly-extending shoulders adapted to interhookingly engage edge portions of the second terminal rim portion of the companion container half-sections upon a pair of said container sections being so interfitted for closure, said first terminal rim portion extending approximately 180 circular degree about its circular body portion, and said second terminal rim portion

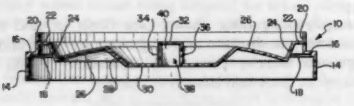
extending approximately the remaining 180 circular degrees about its circular body portion.

4,360,119

COVER FOR SEALING OPEN MOUTH OF A CONTAINER

Amando D. Olivo, Hacienda Totoapan No. 64, Col. Prado Coapa, Mexico 20, D.F., Mexico

Filed Dec. 8, 1980, Ser. No. 213,920
Int. Cl.³ B65D *43/03, 43/04, 51/28*
U.S. Cl. 220—23 **2 Claims**



1. A cover for sealing an open mouth of a container, which comprises a top member and a cylindrical skirt depending from said top member; said top member having means for retaining substances on an interior surface of said top member for treating contents of the container;

said top member comprising a peripheral section adjacent said skirt, a concave section in the center thereof, a convex section between said peripheral and concave sections, and a raised portion constituting a continuation of said convex section, extending diametrically across said concave section and connected to said concave section by generally parallel vertical walls; said raised portion and said walls defining said means; said walls being coupled by a pair of generally parallel, vertical reinforcing members;

said peripheral section comprising a cylindrical protrusion coaxial with said skirt, extending in a direction opposite to that of said skirt, having lateral dimensions less than those of said skirt and coupled to said protrusion by a ledge member extending perpendicular to said skirt and protrusion to form a stepped outer profile on the cover;

said convex section of said top member being coupled to said protrusion by a horizontal member oriented perpendicular to said protrusion and extending inwardly from a lateral surface of said protrusion at a location spaced from a top edge of said protrusion; said concave and convex sections being located entirely below said top edge of said protrusion and not above said horizontal member.

4,360,120

SEALING COMPOSITIONS

David N. Samuel, Great Gransden, and Kenneth M. Sinnott, Huntingdon, both of England, assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jun. 26, 1981, Ser. No. 277,552
Claims priority, application United Kingdom, Sep. 25, 1980, 8030987; Feb. 2, 1981, 8103170
Int. Cl.³ B65D *21/02*
U.S. Cl. 524—494 **6 Claims**

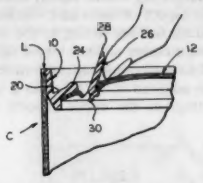
1. A container having a closure sealed to it by a seal that includes a gasket formed of a composition comprising rubbery polymer in which is dispersed filler including an effective amount of crush resistent glass beads having a particle size of about 1 to about 200 microns.

4,360,121

EASY-OPEN LID CLOSURE ARRANGEMENT

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 27, 1981, Ser. No. 248,294
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—270 **5 Claims**



1. An easy-open closure arrangement for a composite plastic and paperboard lid, comprising:

(a) an annular molded plastic rim including an outer, side flange, adapted for attachment to a wall of a container body, and an integral, inner, end flange extending radially radially inward therefrom:

(b) a relatively thin paperboard central panel having a marginal portion of its upper surface bonded to a lower surface of said rim end flange; and

(c) said rim including an integral pull tab being pivotally mounted with respect to said rim, said pull tab having a handle portion and a nose portion, said nose portion being engageable with a portion of said central panel, said handle portion of said pull tab being lifted causing said nose portion of said tab to depress downwardly a portion of said central panel to force it away from said rim end flange and permit the complete detachment and removal of said central panel from said rim.

4,360,122

TANK CAP HAVING SEQUENTIAL ENGAGEMENT AND DISENGAGEMENT

Herbert D. Sullivan, Chicago, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Aug. 10, 1981, Ser. No. 291,535
Int. Cl.³ B65D *41/06, 41/36*
U.S. Cl. 220—295 **8 Claims**

1. In a container cap for use in covering a filler neck of said container said cap comprising:

a cap shell having a cylindrical member having an open end and an apertured integral domed end;

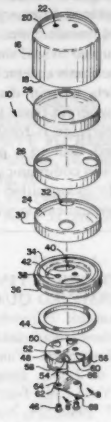
a plurality of apertured baffles including a first baffle carried in the interior of said cap shell;

a platform carried in the interior of said cap shell in proximity to the open end of said cap shell adjacent said first baffle, said platform having a circumferential channel at its cap shell contacting parameter, said circumferential channel defining a central portion having a plurality of apertures including a pair of small diameter apertures;

a secondary tang member having a base portion with a plurality of apertures including a pair of small diameter apertures; said secondary tang members's base portion in contact with and attached to said central portion of said platform; and

a spring tang attached to said secondary tang member, said spring tang being a generally flat plate have a pair of

apertures and first and second end portions, said end portions having inclined engagement guide ramps with



said inclines sloping upwardly to a flat portion of said end portions.

4,360,123

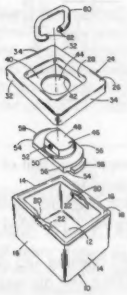
CONTAINER ASSEMBLY HAVING LOCKING MEANS

Wilfred J. Blease, Greenville, N.H., assignor to Pioneer Plastics, Inc., Greenville, N.H.

Continuation-in-part of Ser. No. 164,580, Jun. 30, 1980, abandoned. This application Apr. 23, 1981, Ser. No. 256,897

Int. Cl.³ B65D *41/06, 45/00, 45/28*

U.S. Cl. 220—323 **8 Claims**



1. A container assembly comprising

an open top lower container having a bottom wall, end and side walls, and a peripheral top wall defining a central top opening, the inner surfaces of said side walls having outwardly extending opposed grooves spaced downwardly from and parallel to the plane of said top wall

a cover adapted to be aligned and releasably locked on top of said lower container

said cover having top and bottom surfaces with side and end surfaces extending therebetween and an inner circular surface defining a central opening extending between said cover top and bottom surfaces

the peripheral outer portion of said cover bottom surface being in contact with said lower container peripheral top wall in the aligned position of said cover

aligning means for aligning said cover on top of said container

a locking member rotatably movable between unlocked and locked positions for releasably locking said cover in aligned position on top of said lower container

said locking member having an upper circular mounting portion and a lower locking flange portion

said upper circular locking member mounting portion being rotatably mounted within said cover central opening and extending upwardly therethrough, and

said lower locking flange portion having a pair of opposed outwardly extending flanges parallel to and spaced downwardly from said cover bottom surface for cooperating with said bottom container opposed grooves for locking of said cover and said lower container upon rotation of said locking member relatively to said cover and container in a plane parallel to the plane of said lower container peripheral top wall and said cover bottom surface between an unlocked position with said flanges disengaged from said grooves and a locked position with said flanges received within said grooves

retaining means for normally preventing relative axial movement of said cover and locking member, and

a handle mounted on the upper portion of said locking member above said top surface of said cover for rotating said locking member between its unlocked and locked positions.

4,360,124

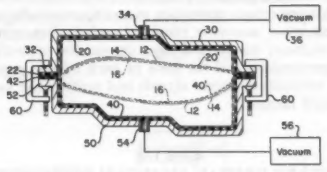
FABRIC-REINFORCED, FLEXIBLE-WALLED CONTAINER AND METHOD OF MAKING SAID CONTAINER

Ernest Knaus; Raymond J. Namsick, and Herbert D. Smith, all of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Continuation-in-part of Ser. No. 82,345, Oct. 5, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,173

Int. Cl.³ B65D *90/04*

U.S. Cl. 220—452 **8 Claims**



1. A fabric-reinforced, complex-shaped, flexible-walled container for holding a volume of a volatile liquid hydrocarbon fuel is characterized by upper and lower sections joined at their peripheries by a molded seam to form a complete volume enclosure, each section vacuum formed in a female mold from a composite material comprising in combination:

a fabric reinforcement comprised of yarns exhibiting a change-in-effective-length characteristic so as to stretch and conform to the container complex configuration upon vacuum forming thereof;

an elastomeric adhesive gum adhered to one surface of the fabric;

an air-impervious nylon plastic film adhered to the adhesive gum and forming the interior ply of the container, said film exhibiting a resistance to the deleterious affects of volatile fuels to provide a barrier against penetration of the fuel into the composite while also enabling vacuum drawing of the composite into the confines of a female mold; and

an elastomeric gum adhered to the other surface of the fabric and forming the outside ply of the container, said gum penetrating the interstices of the fabric to bond to the adhesive gum upon stretching and forming of said fabric

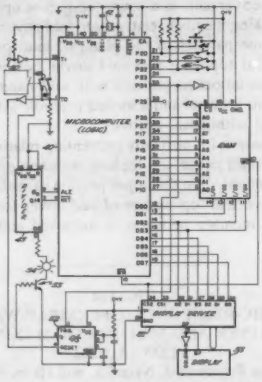
to set and maintain the yarns of the fabric to the shaped container configuration upon curing of the elastomer.

4,360,125

MEDICATION INVENTORY DEVICE

Diane S. Martindale, Plymouth, and Dennis G. Hepp, Coon Rapids, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 10, 1980, Ser. No. 128,931
Int. Cl.³ A47B *67/02*
U.S. Cl. 221—2 **9 Claims**



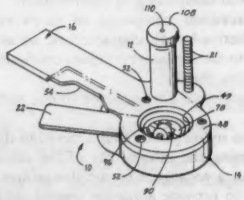
1. In a medication dispenser of the type having means for housing medication to be dispensed, including means operable to allow medication access, and means for providing medication alert signals at preselected times in accordance with a desired medication regimen, the improvement for determining adherence to said desired medication regimen wherein said access allowing means comprises means for providing a signal when medication access is obtained and further comprising readable memory means and logic means for providing data signals representative of the time of each of said medication alert and medication access signals and writing the same into said memory means.

4,360,126

ROTARY DENTAL AMALGAM DISPENSER

Maurice M. Weikel, 3537 S. Buena Vista Dr., Las Vegas, Nev. 89121

Continuation-in-part of Ser. No. 951,079, Oct. 13, 1978, abandoned. This application Sep. 25, 1980, Ser. No. 190,627
Int. Cl.³ G01F *11/22*
U.S. Cl. 221—96 **23 Claims**



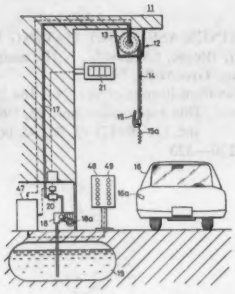
1. A dental amalgam dispenser comprising:
a mercury reservoir
a material distribution shell having a dispensing well extending from the upper to the lower surface thereof, a channel for conducting mercury from said mercury reservoir to a transfer inlet in an arcuate wall, and a channel for conducting mercury from a transfer outlet to said dispensing well, wherein said transfer outlet is located in said wall and is arcuately displaced from and vertically no higher than the level of said transfer inlet,
a transport carriage coupled to said shell for rotation relative thereto about a vertical axis and including a tablet tray for carrying silver tablets to said dispensing well for discharge therein and wherein there is defined a measuring chamber, and said carriage is rotatable in sliding sealed engagement with said wall to a position in which said measuring chamber is in communication with said transfer inlet and alternatively to a position in which said measuring chamber is in communication with said transfer outlet.

4,360,127

APPARATUS FOR SUPPLYING FLUID OF PREDETERMINED QUANTITY

Eisuke Maruyama, Kawasaki; Hiromitsu Kobayashi, Yokohama; Masakazu Mitsuhashi, Kawasaki; Hiromichi Takeuchi, Yokohama; Yoshiki Futamura, Funabashi, and Naohito Suzuki, Kawasaki, all of Japan, assignors to Tokico Ltd., Kanagawa and Tokico Yuki Ltd., Tokyo, both of, Japan

Filed Oct. 17, 1980, Ser. No. 198,244
Claims priority, application Japan, Oct. 19, 1979, 54-135028
Int. Cl.³ B67D *5/30*
U.S. Cl. 222—14 **6 Claims**



1. An apparatus for supplying fluid of predetermined quantity, said apparatus comprising:
a supplying passage for supplying fluid;
an opening and closing valve provided within said supplying passage;
means for opening said opening and closing valve;
locking means for locking said opening and closing valve in an open state;
negative pressure generating means for generating negative pressure upon supply of said fluid outside through said supplying passage;
lock releasing means for releasing the lock of said locking means by the introduction of said negative pressure generated by said negative pressure generating means;
atmosphere introducing means for introducing atmosphere into said lock releasing means to neutralize said negative pressure;
solenoid valve means for interrupting said atmosphere introduction by said atmosphere introducing means;
measuring means for measuring the flow rate of said fluid supplied through said supplying passage; and
control signal transmitting means for transmitting and supplying said control signal to said solenoid valve means when said measured flow rate of said fluid reaches a predetermined flow rate,
said solenoid valve means interrupting said atmosphere

introduction by said atmosphere introducing means according to said control signal,

said lock releasing means closing said opening and closing valve and releasing said lock of said locking means by said negative pressure upon interruption of said atmosphere introduction.

4,360,128

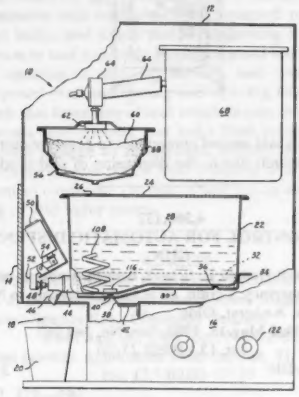
BEVERAGE DISPENSER HAVING TIMED OPERATING PERIOD RESPONSIVE TO RESERVOIR QUANTITY

Charles G. Neumann, Palatine, Ill., assignor to Reynolds Products Inc., Schaumburg, Ill.

Filed Jul. 29, 1980, Ser. No. 173,271

Int. Cl.³ A47J *31/46*; G04C *23/38*

U.S. Cl. 222—26 **9 Claims**



1. Beverage dispensing apparatus including in combination a reservoir adapted to receive a beverage to be dispensed, means for sensing the amount of said beverage in said reservoir, means responsive to user actuation for dispensing said beverage from said reservoir, and means responsive to said sensing means for controlling the period of enablement of said dispensing means.

4,360,129

SYSTEM FOR DISPENSING VISCOUS OR CHUNKY MATERIALS

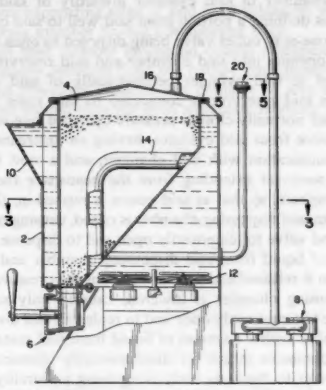
Paul E. Brokaw, Cleveland; Frans L. Adeboi, Berea; Bryan A. Feimer, Broadview Heights; James G. Freeman, East Cleveland; Raymond P. Kawolics, Solon, and Frank C. Stanbrook, Brecksville, all of Ohio, assignors to The Meyer Dairy Products Company, Cleveland, Ohio

Filed Nov. 10, 1980, Ser. No. 205,330

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—146 H **9 Claims**

1. Apparatus for heating, mixing and dispensing flowable material in the form of liquid suspensions or the like comprising: a reservoir having a normally open top closed by a lid movable between open and closed positions; a dispensing valve adjacent the bottom of said reservoir for gravitationally dispensing material therefrom; vacuum means for drawing a vacuum in said reservoir and communicating with the interior of said reservoir adjacent the top thereof; air bleed means communicating with said reservoir adjacent the bottom thereof for bleeding air into said reservoir when said vacuum means is operating; a jacket at least partially surrounding said reservoir in spaced relationship thereto for receiving a heat transfer liquid which is sealed against communication with the interior of said reservoir; heating means for heating said heat transfer liquid to impart heat to said reservoir and material therein; whereby, operation of said vacuum means with said lid in closed position subjects said reservoir to a vacuum and causes air to bubble up through material therein from said air bleed means to continuously mix such material while said



heating means operates to maintain such material hot, and said valve being operable to gravitationally dispense material from said reservoir while said vacuum means is operating to bubble air up through such material.

4,360,130

DISPENSER, PARTICULARLY FOR LIQUID SOAP

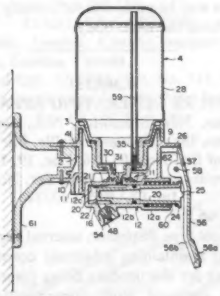
Haruo Nishimura, Suita; Masaaki Nakaya, Toyonaka; Katsuji Nakano, Suita; Noboru Matsuda, Joyo, and Noriyuki Matsumoto, Toyonaka, all of Japan, assignors to Duskin Franchise Kabushiki Kaisha and Kabushiki Kaisha Sunpak, both of Osaka, Japan

Filed Oct. 15, 1980, Ser. No. 197,214

Claims priority, application Japan, Oct. 16, 1979, 54-143171; Aug. 15, 1980, 55-115654

Int. Cl.³ G01F *11/04*

U.S. Cl. 222—153 **3 Claims**



1. A dispenser for liquid such as liquid soap, comprising:

means providing a reservoir disconnectably connected to a main body;

said reservoir including a container having a first normally-closed, pressure-operated one-way outlet valve and securement means by which said reservoir may be disconnectably connected to the main body;

said main body including an upwardly opening well for receiving a latter portion of said reservoir; a cylinder having a inner end in communication with said well; a piston slidably mounted in said cylinder and being provided with resilient means for pushing said piston back out

when said piston is pushed in; releasable securement means on said main body for cooperation with said securement means on said reservoir to disconnectably connect the reservoir to the main body; means defining a dispensing chamber in said cylinder inwardly of said piston; means defining a portion from said well to said chamber; said one-way outlet valve being disposed to open through said opening into said chamber and said reservoir being sealed to said cylinder perimetrically of said opening when said reservoir is connected to said main body; a second normally-closed, pressure-operated one-way outlet valve from said cylinder, having an upstream side in communication with said chamber; and a vent tube for said reservoir extending from the headspace therein, at atmosphere, so that as said piston is pushed-in, the pressure in said dispensing chamber is raised, causing only said second valve to temporarily open and to dispense a quantum of liquid from said dispensing chamber and as said piston is released and pushed back out the pressure in said dispensing chamber is lowered, causing only said first valve to temporarily open and to replenish said dispensing chamber with a quantum of liquid from said reservoir,

said securement means for disconnectably connecting the reservoir to the main body comprising a plurality of lateral protuberances on the main body which fit into corresponding laterally opening recesses provided on cantilevered resilient tabs on the main body; these tabs having externally presented releasing buttons which may be pushed inwards to flex the tabs inwards and thus free the securement means; and

a locking means for preventing accidental disconnection of the reservoir from the main body, said locking means comprising a fixture normally disposed within the main body and mounted therein for limited angular movement; said fixture having tab means protruding out through the main body for external access; said fixture including stop means which in one angular position of said fixture abuttingly back-up said releasing buttons and prevent said releasing buttons from being pushed in sufficiently to free the aforesaid lateral protuberances on the reservoir from the aforesaid laterally opening recesses on the main body and which in another angular position of said fixture are out from behind said releasing buttons so that said releasing buttons may be pushed in sufficiently to disconnect the reservoir from the main body.

4,360,131

PRESSURE GENERATING APPARATUS

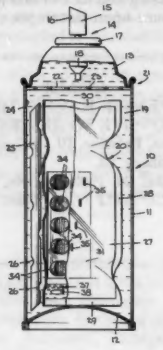
Ellis M. Reyner, New Brunswick, N.J., assignor to Enviro-Spray Systems, Inc., Montgomeryville, Pa.

Continuation of Ser. No. 105,216, Dec. 19, 1979, abandoned. This application Jan. 8, 1981, Ser. No. 223,422

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—386.5 **25 Claims**

1. In an aerosol type dispenser, internal expulsion means for developing and maintaining relatively constant gaseous dispensing pressure for the product being dispensed, said means comprising an enclosed, fluid impermeable flexible pouch disposed within said dispenser, and having a pair of facing wall members, a plurality of pocket members disposed within said pouch in spaced relation to one another and affixed to the interior of a first of said wall members, closure members associated with the interior of the other said wall member and releasably closing each of said pocket members, a first component of a two-component gas generation mixture disposed within each pocket member, the second component of said two-component gas generation mixture disposed within said pouch and externally of said enclosed pocket members, starting delay means disposed within said pouch in contact with said second component for causing the initial generation of gas after a prescribed period of time, said pocket members being sequentially severable from said closure members to empty their contents into



admixture with said second component to generate more gas as said pouch expands due to the dispensing of said product.

4,360,132

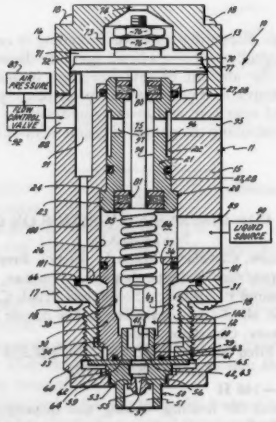
SAFETY CONTROL FOR AUTOMATIC DISPENSING GUN

Burton J. Vilagi; Donald R. Scharf, both of Amherst, and Lawrence J. Macartney, Lorain, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed May 15, 1980, Ser. No. 149,967

Int. Cl.³ B05B *15/06*

U.S. Cl. 222—504 **2 Claims**



1. A fluid pressure actuated despensing gun for applying liquid to a substrate, which gun comprises,

a gun body,

nozzle means comprising a nozzle holder and a nozzle tip fixedly mounted within said nozzle holder, a washer sealingly secured between said nozzle holder and a forward end surface of said gun body, said nozzle holder being removably mounted upon said gun body by a retainer nut engageable with the nozzle holder,

means defining a liquid storage chamber in said gun body,

valve means operable to control liquid flow from said storage chamber to said nozzle means,

means defining a fluid cylinder in said gun body, said fluid

cylinder being coaxially aligned with said nozzle means and said valve means,

a reciprocable piston mounted in said cylinder,

said valve means including a movable valve stem, said valve stem being operatively connected to said piston and extending through said liquid storage chamber to said valve means, such that movement of said piston controls opening and closing of said valve means, a spring for biasing said valve means to a closed position,

said gun body having a first passage means therein for communicating between a source of liquid and said liquid storage chamber,

said gun body having a second passage means therein communicating between a source of fluid pressure and said fluid cylinder,

safety means for preventing said valve means from opening whenever said nozzle means is loosened relative to said gun body, said safety means comprising a third passage means in said gun body connecting said second passage to an opening in said end surface, said washer normally disposed over and sealing said opening from atmosphere such that loosening of said nozzle means on said gun body unseals said opening and leaks fluid pressure from said second passage to atmosphere, thereby precluding fluid pressure on said piston from building to a pressure sufficient to overcome the bias of said spring and effect opening of said valve means.

4,360,133

APPARATUS FOR POURING MOLTEN STEEL

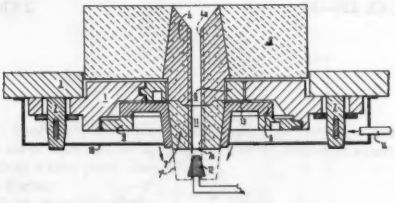
Michel J. Debaise, Mont-sur-Marchienne, Belgium, assignor to Hainaut-Sambre S.A., Charleroi, Belgium

Filed Jan. 30, 1981, Ser. No. 229,855

Claims priority, application Belgium, Jan. 31, 1980, 881486

Int. Cl.³ B22D *41/10*

U.S. Cl. 222—590 **15 Claims**



1. Apparatus for pouring molten steel, comprising a molten steel container having a base plate with an aperture and a nozzle seating brick in the aperture, a mounting chassis removably fixed to the underside of the base plate and extending across the aperture, an upper nozzle having an orifice therethrough mounted on the chassis and inserted in the nozzle-seating brick, a removable lower nozzle having an orifice therethrough coaxial with said orifice in said upper nozzle and in contact with the upper nozzle, releasable means engageable with said chassis for maintaining contact between the nozzles, and means for applying a closure member to said orifice of said lower nozzle.

4,360,134

HEADDRESS DISPLAY DEVICE

Mel Goldberg, New Fairfield, Conn., assignor to Topstone Industries, Inc., New York, N.Y.

Filed Oct. 3, 1980, Ser. No. 193,807

Int. Cl.³ D06C *15/00*

U.S. Cl. 223—66 **2 Claims**

1. A knock-down headdress display comprising:

(a) a head silhouette member;

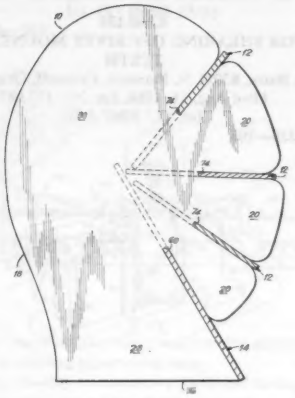
(b) said head silhouette member having a lower supporting edge;

(c) said head silhouette member having an upwardly and angularly extending slit;

(d) the lower end of said slit terminating at one end of said lower supporting edge of said head silhouette member;

(e) a base member having a supporting edge;

(f) said base member having an outline configuration substantially different from the outline configuration of said head silhouette member and defining an area of smaller cross section than the head silhouette member;



(g) said base member having a slit cut therein which selectively interfits with said slit of said head silhouette member;

(h) said base member and said head silhouette member, when connected together, being at right angles to one another; and

(i) said base member, when connected to said head silhouette member, being angularly disposed with respect to said lower supporting edge of said head silhouette member.

4,360,135

LUGGAGE CARRIER

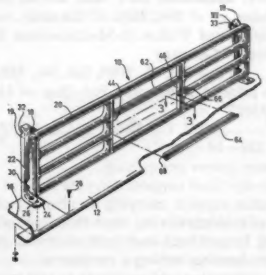
Charles M. Goble, London, Canada, assignor to Trim-Gard Company Ltd., London, Canada

Filed Oct. 22, 1981, Ser. No. 313,743

Claims priority, application Canada, May 5, 1981, 387324

Int. Cl.³ B60R *9/06*

U.S. Cl. 224—42.08 **6 Claims**



1. A luggage carrier for an automobile which has a rear bumper projecting rearwardly therefrom comprising;

(a) a pair of support brackets adapted to be mounted on said bumper; and

(b) a platform pivotably mounted on said brackets for movement between an upright storage configuration and a horizontal load support configuration, said platform having a first pair of transverse supports extending transversely thereof one on either side of the centre of the length of the platform and at least one detachable longitudinal rail extending longitudinally between and detachably connected to said first pair of transverse supports so as to be removable to provide a viewing aperture in said platform proportioned to expose the licence plates of the automobile to view when the platform is in the upright configuration.

4,360,136

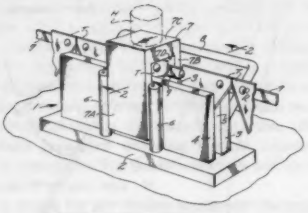
TOOL FOR SHEARING OFF RIVET MOUNTED SICKLE TEETH

Merle R. Bates, 83011 N. Florence, Creswell, Oreg. 97426

Filed Aug. 11, 1980, Ser. No. 177,067

Int. Cl.³ B26F *3/00*

U.S. Cl. 225—103 **4 Claims**



1. A tool for shearing rivets passing through and joining sickle teeth to a sickle bar, said tool comprising,

a base including lengthwise extending upright support members having an opening therebetween, one of said support members having an upper planar surface on which a sickle bar may be temporarily positioned on edge with a sickle tooth disposed in said opening,

guide means on said base, and

an impact member mounted for vertical sliding movement on said guide means, said impact member being of clevis shape to straddle said support members and having an impact surface for contact with the edge of the sickle tooth whereby blows delivered to said impact member are imparted to and cause said tooth to impart a shearing force to rivets joining the sickle bar and tooth.

4,360,137

PLANETARY-GEAR DRIVE FOR LOOPER

Oskar Noe, Mühlheim; Rolf Noe, Berlin, and Andreas Noe, Mühlheim, all of Fed. Rep. of Germany, assignors to BWG Bergwerk - und Walzwerk-Maschinenbau GmbH, Duisburg, Fed. Rep. of Germany

Filed Jul. 15, 1980, Ser. No. 169,493

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933017

Int. Cl.³ B65H *25/20, 17/54*

U.S. Cl. 226—24 **7 Claims**

1. A strip looper comprising:

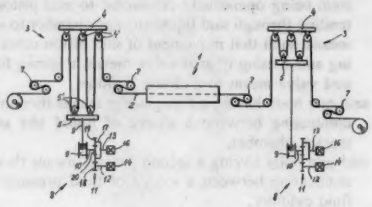
a relatively fixed support carrying a set of guides;

a movable support carrying another set of guides, at least one of said sets having more than one such guide, the strip being looped back and forth over said guides;

a rotary member having a periphery;

means connecting said periphery to said movable support for displacement thereof relative to said fixed support at a velocity dependent on the peripheral speed of said periphery and in a direction dependent on the rotation sense of said periphery;

a planetary-gear transmission having a rotary output connected to said rotary member, two separate rotary inputs, and continuous-mesh gearing interconnecting said inputs and outputs;



a substantially fixed-speed drive motor connected to one of said inputs; and

a variable-speed drive motor connected to the other of said inputs.

4,360,138

APPARATUS FOR REMOVING EXPOSED FILMS AND BACKING STRIPS FROM CASSETTES

Helmut Zangenfeind, Puchheim, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

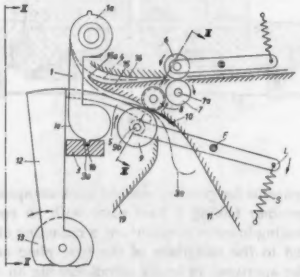
Continuation of Ser. No. 46,499, Jun. 7, 1979, Pat. No. 4,282,997, which is a continuation of Ser. No. 587,231, Jun. 13, 1975, abandoned, which is a continuation of Ser. No. 399,506, Sep. 21, 1973, abandoned. This application Feb. 2, 1981, Ser. No. 230,597

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1972, 2246671

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

Int. Cl.³ G03B *1/56*

U.S. Cl. 226—91 **2 Claims**



1. Apparatus for removing films and backing strips from containers of the type wherein a casing of the container is provided with registering first and second openings and the leader of convoluted backing strip is located between said openings while the leader of the film trails behind said first opening, comprising a pusher movable forwardly and backwards along a predetermined path; locating means arranged to support the casing of a container in such position that the openings of the casing are located in said path whereby said pusher passes, during the forward movement thereof, first through said first and thereupon through the second opening of the casing which is supported by said locating means and expels the leader of the backing strip through the second opening; advancing means located behind the second opening of the casing which is supported by said locating means and arranged to engage and advance the expelled leader of the backing strip

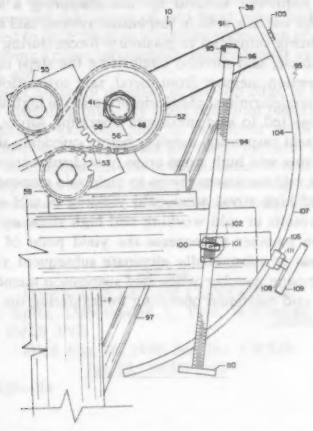
lengthwise in one direction and to thereby draw the film from the casing through the intermediary of the backing strip, said advancing means comprising first and second rotary members located at the opposite sides of said path and means for biasing one of said rotary members against the other of said rotary members; and guide means extending from the second opening for guiding the leader of the film in a second direction bypassing said first and second rotary members; and deflecting means pointed against said second opening between said guide means and said path of movement of said pusher for directing upstream of said first and second rotary members said trailing leader of the film into said second direction.

4,360,139

HIGH SPEED SHEET FEEDING APPARATUS

Michael Wendt, Hope, Mich., assignor to Lyle Development, Inc., Beaverton, Mich.

Filed Jan. 2, 1981, Ser. No. 222,058
Int. Cl.³ B65H *17/26*
U.S. Cl. 226—142 **13 Claims**



1. Sheet feed apparatus for intermittently feeding a continuous sheet, such as a plastic sheet to a work station of a machine, such as a trim press, comprising;

a frame;

sheet engaging means;

means reciprocally mounting said sheet engaging means on said frame for movement in a forward and reverse path of travel to intermittently forwardly index said sheet as said sheet engaging means moves forwardly but permitting said sheet to remain stationary as said sheet engaging means moves rearwardly; and

means for reciprocally driving said mounting means in said forward and reverse path of travel comprising;

a first shaft mounted on said frame;

a second shaft, concentric with said first shaft, rotatably mounted on said first shaft;

means for rotatably driving said second shaft;

a first sprocket wheel fixed to said shaft;

a primary crank arm fixed to said second shaft for rotation therewith;

a second crank arm mounted on said primary crank arm for orbital movement therewith and for rotating movement relative thereto;

a second sprocket wheel fixed to said second crank arm;

endless means trained around said first and second sprocket wheels for rotatably driving said second crank arm in a direction of rotation opposite the direction of rotation of said first crank arm;

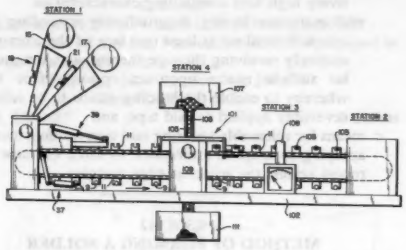
and drive arm means, journaled on said secondary crank arm and coupled to said mounting means, for reciprocally driving said sheet engaging means in said to-and-fro path of travel to intermittently forwardly index said sheet.

4,360,140

FEEDER ASSEMBLY FOR STRIP MATERIAL

Jesse L. Morris, Archer, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 946,047, Sep. 26, 1978, abandoned, which is a continuation of Ser. No. 783,260, Mar. 31, 1977, abandoned. This application Feb. 4, 1980, Ser. No. 117,975
Int. Cl.³ B65H *17/36*
U.S. Cl. 226—162 **8 Claims**



1. A strip material advancing machine for advancing strip material to a winding arbor comprising:

(a) a clamp slidably mounted on a guide and having a pair of jaws for receiving a strip of material; and

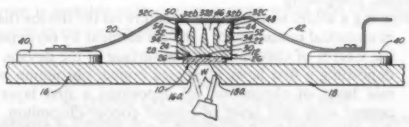
(b) contact means pivoted on one of said jaws and having a cylindrical surface which contacts and clamps said strip material between said contact means and the other of said jaws when said contact means is pivoted in a first direction, means on said one of said jaws for engaging and pivoting said contact means in said first direction for clamping said strip material between said contact means and the other of said jaws, said contact means being pivoted in an opposite direction for releasing said engaging means and said strip material when said strip material is advanced by said winding arbor along said guide independently of said feeder assembly.

4,360,141

HOLDER FOR WELDING SEAM BACK-UP TAPE

Milo M. Kensrue, 601 Lido Park Dr. 8B, Newport Beach, Calif. 92663

Filed Sep. 2, 1980, Ser. No. 183,115
Int. Cl.³ B23K *37/06*
U.S. Cl. 228—46 **15 Claims**



1. As an article of manufacture, an elongate extrusion of a relatively high heat conducting metallic material for use in holding a welding seam back-up tape during a welding operation, comprising:

an elongate body of generally uniform transverse configuration;

a longitudinally extending surface recess for the reception of said back-up tape formed respectively in opposite wall surface faces of said body, each of said recesses having a

longitudinally extending bottom central groove of generally arcuate transverse configuration; and

a plurality of longitudinally extending external heat radiating fins formed on opposite wall side surface faces of said body, said side faces being generally in right angle relation to the faces containing said recesses.

5. A welding seam back-up means for mounting on the back side of the adjacently positioned edge margins of members to be joined by a weld seam, comprising:

a. an elongate tape of flexible material adapted to be positioned in straddling relation over the adjacent edge margins and extending longitudinally therealong;

b. tape holding means adapted to be positioned over said tape; comprising:

an elongate extrusion member of a material having relatively high heat conducting characteristics;

said extrusion having longitudinally extending surface recess formed on at least one face of the extrusion for seatingly receiving the tape therein, and a second similar surface recess upon an opposite face thereof, whereby to enable the holding means to be selectively reversibly applied to said tape; and

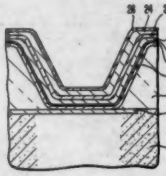
c. means for releasably securing said tape holding means and applying pressure in a direction to force the tape in said recess against the adjacent edge margins.

4,360,142

METHOD OF FORMING A SOLDER INTERCONNECTION CAPABLE OF SUSTAINED HIGH POWER LEVELS BETWEEN A SEMICONDUCTOR DEVICE AND A SUPPORTING SUBSTRATE

Charles Carpenter, Poughkeepsie; Joseph F. Fugardi, Wappingers Falls; Lawrence V. Gregor, Hopewell Junction; Peter S. Grosewald, Putnam Valley, and Morton D. Reeber, Shrub Oak, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 53,463, Jun. 29, 1979, Pat. No. 4,290,079.
This application May 8, 1981, Ser. No. 261,815
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—123 **6 Claims**



1. A process for forming an improved solder interconnection on a semiconductor device and supporting substrate that is resistant to thermal migration of metal atoms in the interconnection, comprising

forming a solder wettable pad structure on the device that is in electrical contact with a device element by (a) depositing a layer of chromium on the surface of the device, (b) depositing a first layer of phased copper-chromium over said layer of chromium, (c) depositing a first layer of copper over said layer of phased copper-chromium, (d) depositing a second phased chromium-copper layer over the said first copper layer, and (e) depositing a second layer of copper over said second phased chromium-copper layer,

depositing a thick layer of solder over the resultant pad structure,

placing the device on a supporting substrate provided with a corresponding solder wettable pad,

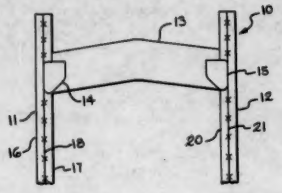
heating to join said pad on the device to the pad on the substrate.

4,360,143

METHOD FOR MANUFACTURING SUSPENSION MEMBERS

John A. Beckman, Denver; Ronald A. Rinehart, Ephrata, and Dennis L. Hammond, Reading, all of Pa., assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 7, 1980, Ser. No. 119,427
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—155 **3 Claims**



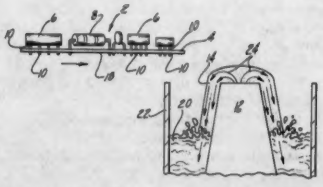
1. An improved method for manufacturing a suspension member for use in a vehicle suspension system, said suspension member being subjected to maximum forces during operation of the vehicle, said method comprising the steps of: forming said suspension member from metal, said suspension member having a predetermined plastic deformation in high stress areas when subjected to said maximum operating forces, and prestressing said suspension member before operating the vehicle by subjecting said high stress areas of said suspension member to at least said maximum forces to yield said suspension member in said high stress areas, said yielding of said suspension member results in cold working said high stress areas of said suspension member to increase the yield point of said high stress areas to substantially eliminate subsequent yielding of said suspension member when said suspension member is subjected to said maximum operating forces during the operation of said vehicle.

4,360,144

PRINTED CIRCUIT BOARD SOLDERING

William A. Cuddy, Montague, N.J.; Basil Thir, Grosse Ile, and Stephen E. Eisenstein, Oak Park, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 21, 1981, Ser. No. 226,970
Int. Cl.³ B05D *5/12*; B23K *31/02*
U.S. Cl. 228—180 R **16 Claims**

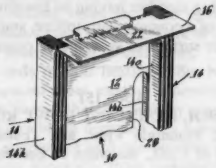


1. A method of wave soldering an assembly comprised of a plurality of electrical conductors disposed on a surface of a sheet of insulating material comprising contacting said surface of said sheet and said conductors with a stationary wave consisting essentially of molten solder and a polyether admixed therewith and floating on the surface thereof, said polyether being the heteric or block copolymer of a dihydroxyphenol and at least one lower alkylene oxide, said copolymer containing at least about 20 percent by weight oxyethylene groups.

4,360,145
DIE-CUT PACKING PAD

John F. Wilcox, Pinson, Ala., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 22, 1980, Ser. No. 189,094
Int. Cl.³ B65D 81/02
U.S. Cl. 229—1.5 R 14 Claims

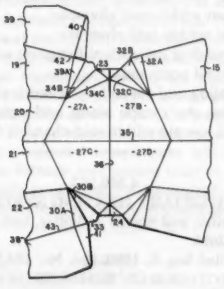


1. A packing pad comprising:
a front panel having opposed side edges and a top edge,
a plurality of upright posts hingedly connected to each of the opposed side edges of said front panel and foldably coupled to each other in accordian style, each of said posts occupying a plane substantially perpendicular to said front panel, and
a top panel hingedly coupled to the top edge of said front panel extending inwardly from said front panel in a plane substantially perpendicular to said front panel and said upright posts wherein said top panel includes a substantially rectangular cut-out in each corner thereof adjacent the top edge of said front panel receiving therein the upright posts coupled to the opposed side edges of said front panel.

4,360,146
OPEN TOP SET UP CONTAINER

Irving M. Koltz, 1329 Steeles A, TH4, Willowdale, Ontario, Canada (M2R 3N2)

Filed Aug. 20, 1980, Ser. No. 179,739
Int. Cl.³ B65D 5/42
U.S. Cl. 229—24 24 Claims

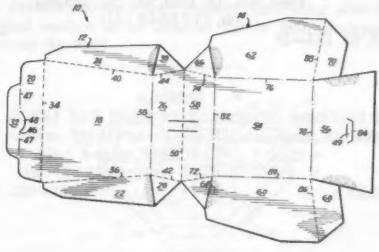


1. A blank for forming a container capable of being rapidly set-up into a self-supporting structure, comprising,
a polygonal base panel having n sides, wherein n is at least eight,
at least n+2 side panels, each of side panels being separated from at least one other side panel by a fold line,
no more than n—4 of said side panels being separated from said base panel by a fold line which forms a peripheral side of said base member,
said side panels being in a first contiguous group and a second contiguous group,
two end members of said side panels being glue flaps,
said first contiguous group including a first set of side panels and said second contiguous group including a second set of side panels, each of said first set and said second set of side panels being panels which do not share a fold line with said base panels,
a first set of support web panels, said first set of support web panels sharing a fold line with at least one panel of said first set of side panels, and each panel of said first set of support web panels sharing a common fold line with each other,
a second set of support web panels, said second set of support web panels sharing a fold line with at least one panel of said second set of side panels, and each panel of said second set of support web panels sharing a common fold line with each other.

4,360,147
SEMI-DOMED PAPERBOARD FOOD CARTON

Arne H. Brauner, 3 Lake Rd., Peekskill, N.Y. 10566, assignor to Arne H. Brauner, Peekskill, N.Y.

Filed May 26, 1981, Ser. No. 267,175
Int. Cl.³ B65D 5/22
U.S. Cl. 229—33 9 Claims



1. A food carton formed from a unitary blank of foldable paperboard comprising:
a bottom tray; a top cover; and hinge means connecting said bottom tray to said top cover;
said bottom tray comprising:
a substantially trapezoidal base panel;
a front closure panel, a lower back panel, and a pair of lower side panels, each hingedly connected to, and extending from, said base panel;
said top cover comprising:
a substantially rectangular top panel;
a substantially trapezoidal upper front panel, an upper back panel, and a pair of upper side panels, each hingedly connected to, and extending from, said top panel;
wherein the upper front panel extends substantially to the junction of the front closure panel and the base panel and the upper side panels partially overlie and frictionally engage the upper edges of the lower side panels whereby a heat and vapor trap is provided when the carton is in a closed position, and the carton is nestable with similar cartons when said cartons are stacked in an open position.

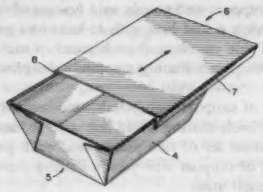
4,360,148
SLIDING LID FOR TAPERED TRAY

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,822
Int. Cl.³ B65D 5/64, 43/12
U.S. Cl. 229—43 9 Claims

1. A sliding lid for an open top tapered tray without a flange, said lid comprising a central panel, side flaps foldably attached along two opposed side edges of said panel, and a pair of glue flaps foldably attached to said side flaps, the improvement wherein said glue flaps are adhered to said central panel in-

wardly of said side flaps and each side flap comprises two panels which are foldably attached to one another and ar-



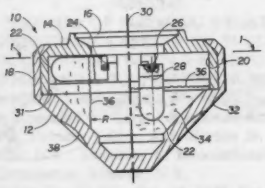
ranged to lie adjacent to one another in planes which are angularly oriented with respect to said central panel.

4,360,149

CENTRIFUGE ROTOR WITH LIQUID SUPPORTED SWINGING TUBES

George N. Hein, Jr., 331 Chesham Ave., San Carlos, Calif. 94070

Filed Nov. 10, 1980, Ser. No. 205,363
Int. Cl.³ B04B 9/12
U.S. Cl. 233—26 **7 Claims**



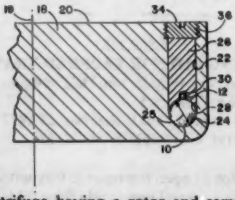
1. A centrifuge rotor comprising:
a rotor body portion having an internal chamber;
at least one fluid sample container pivotally mounted within said internal chamber of said rotor body portion, said container pivotal between a first position and a second position within said chamber; and
liquid means within said internal chamber of said rotor body portion and in contact with said fluid sample container for providing buoyant support to said container when said container pivots between said first and second positions.

4,360,150

CENTRIFUGE APPARATUS FOR REORIENTING GRADIENTS

Kenzo Ishimaru, San Jose, and Steven T. Nielsen, Sunnyvale, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 18, 1981, Ser. No. 274,970
Int. Cl.³ B04B 9/12
U.S. Cl. 233—26 **7 Claims**



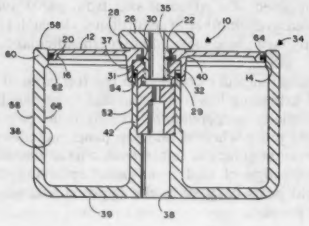
1. A centrifuge having a rotor and sample containers for reorienting gradients and separating the components of a sample, the combination comprising:
a rotor having a top surface containing a plurality of cylindrical recesses equally spaced with respect to the rotational axis of said rotor;
said recesses being open at the top and having a concave hemispherical bottom;
a sample container formed in the shape of a hollow sphere disposed in each said cylindrical recess and supported by the hemispherical bottom of said recess;
a cylindrical plug member having its lowermost end formed in the shape of a concave hemisphere, and said end engaging the upper surface of said sample container.

4,360,151

AEROSOL RESISTANT BOWL ROTOR

Mark J. Cowell, Mountain View, and Thomas D. Sharples, Atherton, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 1, 1980, Ser. No. 164,877
Int. Cl.³ B04B 7/02
U.S. Cl. 233—27 **5 Claims**



1. A centrifuge rotor comprising:
a body having an interior chamber, the upper end of said body having an opening to permit installation and removal of fluid sample containers;
a transparent lid with a cylindrical outer periphery;
means for connecting said lid to said body;
means for sealing said cylindrical outer periphery of said lid with said opening, said sealing means preventing the escape along said lid periphery of any aerosolized liquid sample from within said chamber;
a central post within said chamber;
a central depending cylindrical flange on said lid for receipt of said central post; and
means for sealing said depending cylindrical flange with said post so that the escape along said central post of any aerosolized sample within said chamber is prevented.

4,360,152

AUXILIARY HEATING SYSTEM

Lester E. Schlatter, and Steven J. Miller, both of R.R. 1, Wayland, Iowa 52654

Filed Sep. 8, 1980, Ser. No. 184,920
Int. Cl.³ F24D 1/00
U.S. Cl. 237—13 **4 Claims**

1. In combination with a forced-air heating system including a furnace having a heat source therein, a hot air duct connected to said furnace for conveying hot air to a space to be heated, and a cold air duct connected to said furnace for returning cool air from said space to said furnace, the invention comprising an auxiliary boiler adapted to be stoked with combustible material, comprising,
a boiler tank adapted to be substantially filled with a heat exchanger fluid,
a firebox extended into said tank and adapted to receive combustible material for heating the fluid in said tank,
a heat exchanger disposed within said cold air duct,
a hot water supply conduit connected at one end to said tank

and connected at its opposite end to said heat exchanger for supplying warm fluid thereto,

a cold fluid return conduit having opposite ends connected to said heat exchanger and tank respectively, and

pump means for pumping hot fluid from said tank through said supply conduit to said heat exchanger whereby cool air moving through said cold air duct is pre-heated as it passes through said heat exchanger,

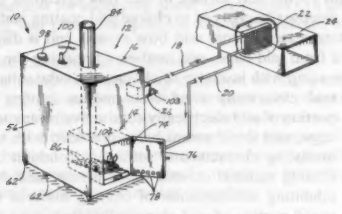
a plurality of heating tubes extended through said firebox and in communication with said tank at the opposite ends thereof for heating fluid in said tubes,

the opposite ends of said heating tubes being disposed in vertically spaced-apart relation whereby fluid heated in said tubes is passed therethrough by convection flow,

said heating tubes being disposed in a lower portion of said firebox for supporting said combustible material thereon,

a flue extending upwardly from said firebox through said tank,

a plurality of heating tubes extending through said flue and in communication with said tank at the opposite ends thereof for heating fluid in said tubes,



said boiler tank including a top wall, bottom wall, front and rear wall portions, and opposite side wall portions, said firebox including an open end which opens through said front wall portion, and further comprising a movable door adapted to at least partially close said open end at times,

means for supporting said firebox in spaced relation from said bottom wall, top wall, side wall portions, and rear wall portion whereby said firebox is substantially surrounded by fluid except at the open end thereof,

a first thermostat operatively positioned in said space to be heated and electrically connected to said furnace for activating said heat source of the furnace when the temperature in said space falls below a first selected temperature, and a second thermostat operatively positioned in said space and electrically connected to said pump means for activating said pump means when the temperature in said space falls below a second selected temperature higher than said first selected temperature whereby said heat source of the furnace will remain inactive for so long as the temperature in said space is maintained above said first selected temperature by said heat exchanger.

4,360,153

FOLDABLE TRACTION-MAT FOR MOTOR VEHICLES

Richard Mantion, 375-A Louis-Fortier, LaSalle, Quebec, Canada (H8R 3K4), and Jean-Paul Normandeau, 11,023 Hebert, Montreal Nord, Quebec, Canada (H1H 3X2)

Filed Feb. 18, 1981, Ser. No. 235,710

Int. Cl.[3] E01B *23/00*

U.S. Cl. 238—14 **7 Claims**

1. A traction mat comprising:

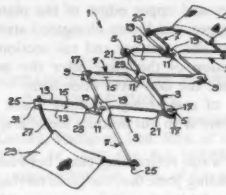
a first set of traction bars arranged end to end and joined together at their adjacent ends by first pivot means;

a second set of traction bars, equal in number to the first set, arranged end to end and joined together at their adjacent ends by second pivot means;

the bars in both sets being arranged with their wide sides facing each other, each bar of the first set crossing a corresponding bar of the second set generally at their midpoints;

third pivot means pivotably connecting each crossed pair of bars together;

wherein the end portions and the central portion of each bar are twisted about the longitudinal axis of the bar to be



ninety degrees out of phase with the remainder of the bar, and

wherein the end and central twisted portions are sized to have the transition portion on one bar extending between the twisted and untwisted portions, interfering with the twisted portion of an adjacent bar to limit movement between the bars.

4,360,154

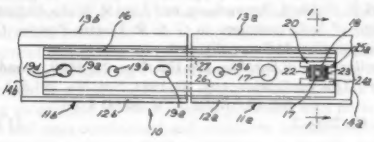
RAIL JOINT BAR BOLT NUT LOCKING ASSEMBLY

Jesse P. Collins, 310 Harpers Ferry Rd., Louisville, Ky. 40214

Filed Aug. 18, 1980, Ser. No. 179,127

Int. Cl.[3] E01B *11/38;* F16B *39/02, 39/10*

U.S. Cl. 238—262 **6 Claims**



1. Apparatus for maintaining track rail joints to proper alignment comprising:

a pair of elongated joint bars adapted to span predetermined lengths of adjoining rail sections and to fit between the rail head and rail base and having a plurality of bolt holes aligned with corresponding bolt holes of the fish of each length of rail sections;

a plurality of bolts individually extending through said aligned bolt holes;

a nut threaded onto each of said bolts;

and a plate interposed between each of said nuts and one of said joint bars, each plate having a bolt hole and a pair of horizontally extending tabs disposed on opposite sides of the bolt hole and sized approximately that of the hole diameter to be bent away from the joint bar and against the nut after the nut has been drawn down and tightened onto the plate to exert restraining force on the nut and prevent loosening rotation of the nut, the plate having an H-shaped configuration after bending of the tabs with the legs of the H extending horizontally, the width of the plate being sufficient for lower and upper sides of the plate legs to engage elongated stationary projecting lower and upper surfaces of the assembled rail sections and bars so as to prevent rotation of the plate after the nut has been tightened.

3. Apparatus for restraining a nut from loosening rotation on a bolt of a track rail section and joint bar assembly comprising:

a plate member having a bolt hole and being adapted to be interposed between the nut and joint bar of said assembly, the plate having a pair of tabs formed therein adjacent the

bolt hole and sized approximately that of the hole diameter on opposite sides thereof horizontally and adapted to be bent away from the plate after the nut has been tightened on the bolt to exert restraining force on the nut, the tabs being so formed in the plate so that, upon bending of the tabs after installation, the plate has an H-shaped configuration with horizontally extending legs having lower and upper edges, the width of plate being sufficient for said lower and upper edges of the plate member legs to engage upper and lower elongated stationary projecting surfaces of the joint bar and rail section assembly to prevent rotation of the plate after the assembly has been formed and the tabs have been bent.

6. Method of assembling abutting track rail sections and mating joint bars with nut holding members, the method comprising:

interposing a nut restraining plate between each bolt and a corresponding joint bar, the plate having a bolt hole and a pair of bendable tabs sized approximately that of the hole diameter adjacent but spaced from the bolt hole on opposite sides thereof horizontally and having horizontally extending legs such that, after bending of the tabs, the plate has an H-shaped configuration;

positioning the plate with lower and upper sides of said horizontally extending legs engaging lower and upper elongated stationary projecting surfaces of the resulting rail section and joint bar assembly;

tightening the nut on the bolt;

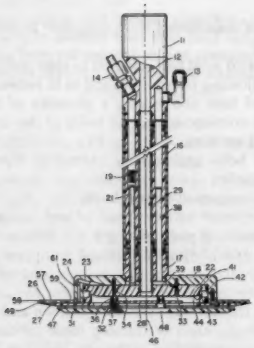
and bending the tabs toward the nut and away from the joint bar to exert a restraining force on the nut to prevent loosening rotation of the nut.

4,360,155

POWDER COATING DISTRIBUTOR

Mark E. Hubbell, Brownsburg, and Alan R. Riebe, Indianapolis, both of Ind., assignors to G & R Electro-Powder Coating Corporation, Indianapolis, Ind.

Continuation of Ser. No. 106,100, Dec. 21, 1979, abandoned.
This application Aug. 10, 1981, Ser. No. 291,313
Int. Cl.³ B05B *5/04*; B05D *1/06*
U.S. Cl. 239—3 **11 Claims**



1. An apparatus for dispensing a coating material in dry form and including a generally planar distributor disk of electrical insulating material with front and rear surfaces, the front surface having an outer perimetrical edge and at least one aperture spaced inwardly from said edge and communicating with a source of said coating material, and means for directing a flow of said coating material from said aperture outward along said front surface to said edge, and electrically conductive means on the rear surface of said disk extending to said edge and electrically charged to charge said coating material as said coating material from said flow crosses and is dispensed outward from said edge, and including the improvement comprising:

an insulator shield disposed on said rear surface and covering a substantial portion of said electrically conductive means and extending to a location adjacent the said perimetrical edge and leaving exposed a portion of said electrically conductive material adjacent said edge said shield having an electrical insulating characteristic sufficient to inhibit charging of coating material on said shield and said shield inhibiting accumulation of coating material on the said exposed portion of said electrically conductive means.

10. A method of inhibiting uneven distribution of electrostatic coating material from a powder coating material distributor having a generally planar distributor disk of electrical insulating material with front and rear surfaces, the front surface having an outer perimetrical edge and at least one aperture spaced inwardly from said edge and communicating with a source of said coating material, and means for directing a flow of said coating material from said aperture outward along said front surface to said edge and electrically conductive means on the rear surface of said disk extending to said edge and electrically charged to charge said coating material as said coating material from said flow crosses and is dispensed outward from said edge, said method comprising the step of:

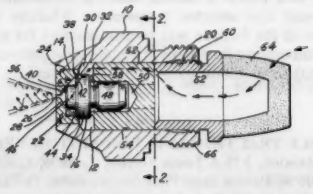
covering with insulator shield means a substantial portion of said electrically conductive means, leaving exposed a portion of said electrically conductive means adjacent said edge, said shield means being provided with an electrical insulating characteristic sufficient to inhibit charging of coating material on said shield means, said shield means inhibiting accumulation of coating material on said exposed portion of said electrically conductive means.

4,360,156

FLUID METERING AND SPRAYING

J. Michael Soth, Urbandale, and Roy E. Pack, Jr., Winterset, both of Iowa, assignors to Delavan Corporation, West Des Moines, Iowa

Filed May 27, 1980, Ser. No. 153,837
Int. Cl.³ B05B *17/04*
U.S. Cl. 239—11 **28 Claims**

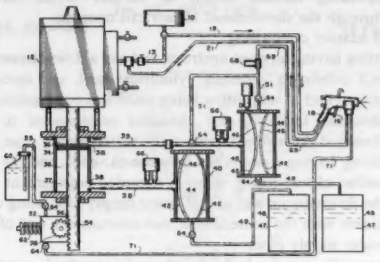


20. A method of metering fluid which may contain solid particulates at low flow rates comprising flowing said fluid through an orifice having at least one which is substantially rectangular in a cross sectional plane perpendicular to the axis of the fluid flow therethrough, said opening having a ratio of minimum width to minimum depth, or vice versa, of less than approximately 1.5, the lesser of said minimum width and said minimum depth not exceeding approximately 0.2 mm, and a ratio of length to the lesser of minimum width and minimum depth of less than approximately 2.0.

4,360,157
PLURAL COMPONENT SYSTEM

Marc A. Quenneville, 8976-69th St. N., Pinellas Park, Fla. 33565

Filed Sep. 22, 1980, Ser. No. 189,716
Int. Cl.³ B05B 7/04, 9/04
U.S. Cl. 239—61 10 Claims



1. An apparatus for supplying plural components to a device for applying said plural components to a work surface, comprising,

at least a pair of component reservoirs,

at least two component pumping chambers of like pumping capacity and releasably connected between said component reservoir and a device for applying plural components to a work surface so that both of said component pumping chambers can be connected between a common reservoir and said device or between said device and a reservoir individual to each of said component pumping chambers.

at least one catalyst reservoir,

at least one catalyst pumping means operatively and releasably connected between said catalyst reservoir and said device for applying plural components,

means for controlling the ratio of the amount of catalyst, pumped from said catalyst reservoir to said device, to the amount of components pumped from said component reservoir to said device by said pumping chambers of like capacity,

each of said component pumping chambers having a pair of opposed, spaced-apart, substantially flexible bladders disposed therein,

said bladders dividing each of said component pumping chambers into a component passageway therebetween and an operating fluid chamber therebeyond,

reciprocating means for increasing the amount of operating fluid in one of said operating fluid chambers while substantially simultaneously decreasing the amount of operating fluid in the other of said operating fluid chambers on a sequentially continuous, alternating basis so that one pair of opposed bladders responds to an increased amount of operating fluid surrounding said bladders by being convergingly displaced relative to each other while the other pair of said bladders are divergingly displaced relative to each other, responsive to the decrease in the amount of surrounding operating fluid,

said reciprocating means further operatively connected to said catalyst pumping means so that the reciprocating motion of said reciprocating means operates said catalyst pumping means,

whereby said apparatus has the flexibility to provide at least three different ingredients to said plural component device, wherein two of said components are provided to said device in substantially equal amounts, and wherein a third catalyst ingredient is provided to said device at a predetermined ratio relative to said first two components, and,

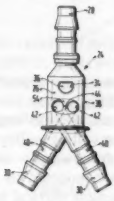
whereby disconnecting said catalyst reservoir from said plural component device provides an apparatus for delivering two different components to said plural component device in substantially equal quantities in the absence of said catalyst, and disconnecting one of said component reservoirs from said apparatus provides an apparatus for delivering a single component through both of said component pumping chambers to said plural component device and,

whereby the segregation of said component pumping chambers and said operating fluid chambers and the provision of multiple reservoirs obviates the need to clean said component pumping chambers when changing from the application of a singular component to the application of plural components.

4,360,158
WASHING ARRANGEMENT FOR WINDOWS OF POWER VEHICLES

Peter-Josef Bauer, Bühl, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 16, 1980, Ser. No. 197,658
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945440
Int. Cl.³ B60S 1/48
U.S. Cl. 239—284 R 6 Claims



1. A washing arrangement for a window of a motor vehicle, comprising a washing liquid supply means; a main conduit extending from said supply means; a plurality of transverse conduits each connected with a spraying nozzle; and a branching element connecting said main conduit with said transverse conduits, said branching element including a branching member formed as a valve body of a check valve, said valve body having an axis and an outer surface provided with ports into which said main conduit and said transverse conduits are open, said branching element further including a flexible tubular member which closes said ports and is fitted onto said valve body with prestress, said valve body being provided with a plurality of transverse openings which extend substantially parallel to each other and into each of which a respective one of said transverse conduits is open, said plurality of transverse openings including at least two transverse openings separated from one another by a web portion, each of said two transverse openings having a predetermined length and two of said ports spaced from one another in the transverse direction, said valve body having a groove provided in the region of each port of said two transverse openings and said web portion, so that said web portion has a length which is smaller than the length of said two transverse openings, said web portion having two ends spaced from one another in a transverse direction, and said flexible tubular member abutting against said ends of said web portion with a prestress which is smaller than that with which said flexible tubular member abuts against the remaining portion of said valve body.

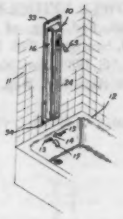
4,360,159
ADJUSTABLE SHOWER HEAD

Joseph C. Haynes, 1206 Lexington Pkwy., Ypsilanti, Mich. 48197

Filed Nov. 3, 1980, Ser. No. 203,744
Int. Cl.³ B05B 15/08
U.S. Cl. 239—282 8 Claims

1. An adjustable shower apparatus for use with a source of liquid under pressure comprising a housing having an elongated vertical opening therein, a shower head having first and second end portions, said first end portion of said shower head

being disposed outwardly of said housing, said second end portion of said shower head extending through said vertical opening, said shower head being vertically adjustable along said vertical opening, an elongated flexible pipe means disposed within said housing, first connector means within said housing for connecting one end of said pipe means to said second portion of said shower head and second connector means for connecting the other end of said pipe means to the source of liquid under pressure, travelling pulley means disposed within said housing in vertically spaced relationship below the source of liquid under pressure, pipe guide means



mounted within said housing in vertically spaced relationship to and above said travelling pulley means, said flexible pipe means extending from said second connector means downwardly and under said travelling pulley means and over said pipe guide means and downwardly to said first connector means, tensioning means connected to said travelling pulley means for applying a constant vertical tension on said flexible pipe means, vertically extending guide means slidably engaging said tensioning means and extending generally less than one-half the height of said housing, and means for retaining said shower head in an adjusted position relative to said elongated vertical opening in said housing.

4,360,160

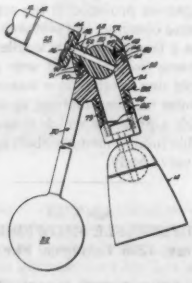
SHOWERHEAD CONTROL ADAPTER

Emile Jette, 1328 NE. 110 Ter., Miami, Fla. 33161

Continuation-in-part of Ser. No. 868,200, Jan. 9, 1978, which is a continuation-in-part of Ser. No. 818,441, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 790,277, Apr. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 743,766, Nov. 22, 1976, abandoned. This application Jul. 16, 1979, Ser. No. 57,665

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—289 **3 Claims**



1. A remote control device to control fluid flow through a showerhead and comprising an adapter in combination with a showerhead for use at a showerhead installation having a vertical surface with a water supply pipe having a threaded downstream end projecting from the vertical surface wherein the threaded downstream ends defines a normal flow path to direct a stream of water of preselected temperature outwardly and downwardly from the plane of the vertical surface,

said showerhead having a through bore and an upstream end with a female threaded socket sized to mate in fluid flow relation with the threaded end of the supply pipe and a downstream water flow exit opening and said showerhead including diffuser means to diffuser water flowing through the showerhead at said exit opening,

said adapter comprising,

a fitting having an open upstream end and a downstream end and defining a generally cylindrical wall, said open upstream end of said fitting being sized and companionately threaded internally for threaded engagement to the threaded downstream end of the water supply pipe, said fitting having a centerline between the ends, and the centerline of said fitting when in threaded engagement with the downstream end of said water supply pipe being coincident with the centerline of said downstream end of said water supply pipe,

a generally tubular body having a longitudinal centerline and said body having an upstream end and a downstream end, and a through bore defining a flow through path between the ends, said downstream end defining a cylindrical externally threaded nose and said nose being sized for threaded engagement in the female socket of the showerhead structure with the centerline of said tubular body being coincident with a centerline through the showerhead and along the flow path,

swivel joint means captivatingly connecting the fitting and the tubular body for swinging movement of the tubular body when connected to a showerhead relative to the fitting through a predetermined range of swinging movement and comprising mutually interengaging means defining a flow path communicating between the interior of the fitting and the bore of the tubular body,

said adapter including an elongate operator member extending downstream of the tubular body and substantially beyond the downstream end in diverging relation with respect to the centerline of the tubular body,

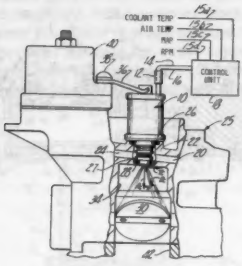
said mutually intercooperating means comprising an outwardy extending portion defining a neck on said fitting in axial alignment with said fitting, said neck having a through bore and terminating in a distal spherical head portion, said head portion having a through bore aligned with the through bore of said neck, and wherein an annular threaded connection member is provided on said tubular body, said tubular body having an externally threaded upstream end, said connection member having an open end defining an annular shoulder and being captivated on said neck and head portion,

said mutually interengaging means comprising valve means and said valve means including upstream facing surfaces on said tubular body in blocking engagement of said through bore of said spherical head portion when said elongate operator member is swingably moved such that the operator member is closely adjacent said vertical surface and swingable so that the bore is in fluid communication with the through bore of the tubular body when said member is swingably moved away from said vertical surface to permit waterflow to the showerhead, and seal means captivated between said tubular body, said head portion and said annular threaded connection member to restrain fluid flow to downstream flow when said surface of said tubular body is in blocking relation of the through bore of said head portion, said valve means including means to provide a water trickle leak therethrough when in said valve closed position to prevent a cross flow of water between the hot and cold water supply lines.

4,360,161
ELECTROMAGNETIC FUEL INJECTOR

William B. Claxton, Bloomfield; Gary L. Casey, Troy; Albert Blatter, Southfield, and John A. Miller, Auburn Heights, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 7,444, Jan. 29, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 210,976
Int. Cl.³ B05B 1/34
U.S. Cl. 239—463 11 Claims



1. An electromagnetic fuel injector having an energizable stator means for controlling the movement of a valve member of a valve assembly to open and close the injector and thereby meter fuel, said valve assembly comprising:

a valve housing including a valve housing bore terminating with a valve seat which is connected to an exit orifice;

a valve member including a ball valve connected by a flexible stem to an armature means and is reciprocally located in said valve housing bore, operable to obturate said exit orifice by sealing said valve seat with said ball valve, said ball valve having a diameter substantially equivalent to said valve housing bore such that a housing interface is formed;

a swirl chamber being defined when the injector is closed by the volume included between said ball valve and said valve housing bore for imparting to the fuel flow exhausted from the exit orifice a swirl component that is tangential with respect to the spray axis of the injector; and

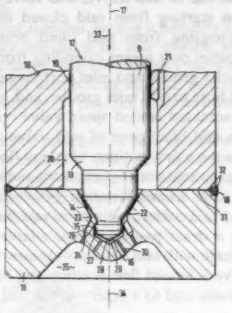
means for supplying fuel from a pressurized source to said swirl chamber including at least one entry metering orifice of a predetermined size communicating fuel between said source and said swirl chamber and positioned between said housing interface and said valve seat.

4,360,162
FUEL INJECTION NOZZLE WITH CONTROLLED CROSS-SECTION OF INJECTION FOR INTERNAL COMBUSTION ENGINES

Konrad Eckert, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 28, 1980, Ser. No. 134,820
Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920100
Int. Cl.³ B05B 1/30
U.S. Cl. 239—533.4 1 Claim

1. A fuel injection nozzle having a controlled cross-section of injection for internal combustion engines, comprising, a nozzle body, said nozzle body including separate upper and lower smooth planar faced body portions, said upper and lower body portions including axially aligned guide bores, said guide bore in said lower body portion including a valve seat having the shape of a truncated cone in combination with a cylindrical bore and a conical depressed zone, a needle valve having a valve cone in said truncated cone guide bore and a pin means on an extremity thereof, said nozzle body forming with said valve cone a first pressure chamber with first injection ports, said first injection ports including a cylindrical countersunk linear portion extending from said first pressure chamber, said first injection ports being controlled by said valve cone of said needle valve, a second pressure chamber formed by said

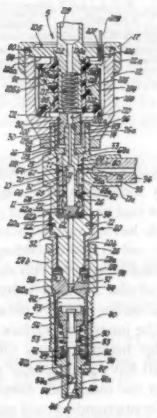


pin means on said needle valve and said conical depressed zone in said lower body portion, said second pressure chamber being provided with second injection ports, characterized in that said nozzle body upper and lower smooth planar faced portions are welded together with their smooth faces adjacent each other.

4,360,163
ELECTROMAGNETIC DIESEL FUEL INJECTOR

Donald L. Williams, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1981, Ser. No. 226,160
Int. Cl.³ F02M 59/00
U.S. Cl. 239—533.5 3 Claims



1. An electromagnetic fuel injector comprising:

a housing means having an axial stepped bore extending therethrough and having an inlet port opening into said stepped bore intermediate the ends thereof, said inlet port being connectable to a source of pressurized fuel; a pressure actuated injection nozzle operatively connected to one end of said housing means in flow communication with an associated one end of said stepped bore; a cylindrical valve sleeve having a blind bore extending from one end thereof fixed in said stepped bore with the closed end of said valve sleeve located adjacent to said injection

nozzle, said valve sleeve having at least a pair of axially spaced apart externally first and second lands thereon with an annular inlet groove therebetween that is positioned for flow communication with said inlet port and, an annular outlet groove extending from said second land to said closed end of said sleeve, said valve sleeve having, in succession starting from said closed end, a drain port means extending from said blind bore to said outlet groove, outlet port means extending from said blind bore to said outlet groove and inlet port means extending from said blind bore to said inlet groove; and, a normally closed solenoid actuated landed spool valve operatively associated with said blind bore of said valve sleeve for movement between a first position blocking flow from said inlet port means to said outlet port means and a second position effecting flow communication between said inlet port means and said outlet port means; said landed valve spool including a drain passage means adapted at one end to communicate with said drain port means when said landed spool valve is in said first position and being connectable at its opposite end to a reservoir for fuel at low pressure.

4,360,164

ELECTROMAGNETICALLY ACTUATED FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES

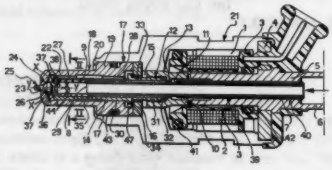
Francesco Bellicardi; Giorgio Zucchi, both of Bologna, and Roberto Giusberti, Pianoro, all of Italy, assignors to Weber Carburatori Azienda della Weber S.p.A., Bologna, Italy

Filed Oct. 15, 1980, Ser. No. 197,383

Claims priority, application Italy, Oct. 19, 1979, 3515 A/79

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—585 **2 Claims**



1. An injection valve comprising a hollow casing, an electromagnetic winding located in said casing, an axially sliding tubular armature in said casing in close proximity to said winding, a hollow nozzle having an axial bore secured to said casing at one end thereof and axially extending therefrom, an axially sliding closure means located within said hollow nozzle comprising a hollow tubular member secured at one end to said armature with the outer surface thereof disposed in sliding engagement with the inner wall surface of said hollow nozzle, said hollow tubular member being closed at one end by a transverse end wall having an axially extending conical part secured thereto on the outer side thereof, a conical seat disposed in said nozzle surrounding said axial nozzle bore complimentary to said conical part for opening and closing said bore, a fuel atomizing deflector connected to said conical part and extending through said nozzle bore, a fuel supply conduit axially extending through said electromagnetic winding, said tubular armature and said hollow tubular member with one end thereof opening into said hollow tubular member adjacent said transverse end wall, a plurality of bores formed in said end wall of said closure means around said conical part, the longitudinal axis of said bore is being placed at an angle less than 90° with respect to the longitudinal axis of said closure means and spring means disposed between said one end of said fuel supply conduit and said transverse end wall of said closure means.

4,360,165

ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

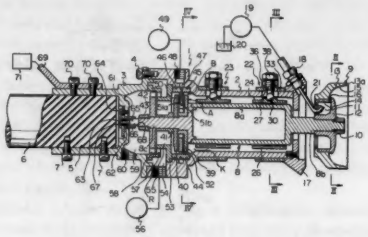
Matsuyoshi Sugiyama, Susono; Teru Morishita, Shizuoka, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 22, 1980, Ser. No. 199,686

Claims priority, application Japan, May 23, 1980, 55/67913

Int. Cl.³ B05B *5/04*; F16C *7/04, 17/10*

U.S. Cl. 239—703 **13 Claims**



1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

a metallic rotary shaft rotatably arranged in said housing and having a front end and a rear end;

a cup shaped metallic spray head fixed onto the front end of said rotary shaft and having a cup shaped inner wall;

feeding means for feeding a paint onto said cup shaped inner wall;

drive means cooperating with said rotary shaft for rotating said rotary shaft;

non-contact type radial bearing means arranged in said housing and cooperating with said rotary shaft for radially supporting said rotary shaft under a non-contacting state;

air supply means producing air under pressure;

a stationary annular plate fixed onto said housing and having opposed side walls, said annular plate having a plurality of air outflow bores which are formed on the opposite side walls of said annular plate and are connected to said air supply means;

a pair of runners fixed onto said rotary shaft and arranged on each side of said annular plate, each of the side walls of said annular plate being slightly spaced from said corresponding runner and having a peripheral wall portion and a central wall portion which faces said corresponding runner and has said air outflow bores formed thereon, said annular plate having at least one pressure balancing bore which passes through said annular plate and is arranged in said peripheral wall portion located radially outwardly from said runners;

a generator generating a negative high voltage and having an output connected to said housing, and;

electrode means arranged in said housing and electrically connecting said output to said spray head.

4,360,166

MOTOR-DRIVEN SHREDDING APPARATUS PARTICULARLY FOR GARDEN WASTE

Horst Biersack, Sachsen, Fed. Rep. of Germany, assignor to Firma Cornes & Co. OHG, Ansbach, Fed. Rep. of Germany

Filed Aug. 18, 1980, Ser. No. 179,378

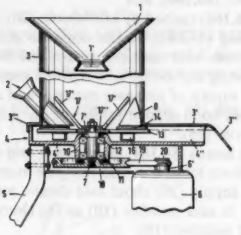
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1979, 2934792

Int. Cl.³ B02C *18/12*

U.S. Cl. 241—92 **8 Claims**

1. Motor-driven shredding apparatus for comminuting waste material, particularly garden waste, which comprises a cutter housing having a laterally-directed outlet for the discharge of

shredded waste material, a cutter support plate mounted within the cutter housing for rotation about a central vertical axis, a frame supporting the cutter housing and carrying a motor for rotatably driving the cutter support plate, respective inlets arranged above the cutter housing and serving to direct light material to be shredded and heavy material to be shredded separately towards the cutter support plate, at least one radial slot in the cutter support plate, a shredding cutter mounted upon the cutter support plate above each radial slot and cooperating therewith on rotation of the cutter support plate to shred waste material and direct the shredded material downwardly through the cutter support plate, a cylindrical charging container for receiving waste material to be shredded located over the cutter housing, the cutter support plate being positioned so as to form the base of the container, at least one shredding blade mounted on the upper side of the cutter support plate for rotation therewith and extending upwardly and in an outwardly-inclined manner relative to the central vertical axis into the charging container, at least one fixed counter-plate located within the container for cooperating with each shredding cutter and also with each shredding blade and positioned so that the path of rotation of each shredding cutter is below and adjacent each fixed counter-plate and so that the path of rotation of each shredding blade is above and adjacent each fixed counter-plate, the inlet for light material to be shredded being located at the top of the container and the inlet for heavy material to be shredded comprising a downwardly-inclined inlet tube passing through the lower wall part of the container to discharge above the cutter support plate and at least one dependent discharge blade on the cutter support plate for directing shredded waste toward the laterally-directed outlet.



4,360,167

APPARATUS FOR THE REDUCTION OF BIG CYLINDRICAL BALES OF HAY, STRAW AND THE LIKE AND FOR THE DISTRIBUTION THEREOF

Ferruccio Beccalori; Gianguido Corvi; Giovanni Merli; Giancarlo Tamburoni, and Lorenzo Tamburoni, all of via Zena 15, Carpaneto (Piacenza), Italy

Filed Sep. 29, 1980, Ser. No. 192,006
Claims priority, application Italy, Nov. 13, 1979, 27260 A/79
Int. Cl.³ A01D *87/12, 90/10*
U.S. Cl. 241—101 A **9 Claims**

1. An apparatus for the discharge of hay-like material from a cylindrical bale thereof, which apparatus is adapted to be pulled by a tractor having a three point hydraulic lifting linkage, comprising:

a trailer having a chassis and a pair of articulating wheels connected to the chassis adjacent a rear end thereof for movement of the trailer;

connection means connected to the chassis adjacent a front end thereof for connecting said trailer to the three point hydraulic lifting linkage of the tractor so that the tractor can move the trailer in a travel direction;

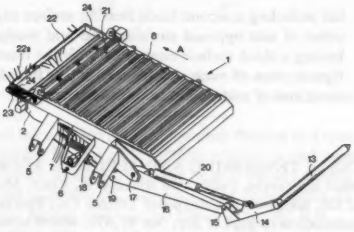
a conveyor connected to said chassis for movement in a horizontal and transverse direction to the travel direction over the top of said chassis, said conveyor having a discharge side adjacent the lateral side of said chassis for conveying hay-like material across said chassis;

cutting means connected to said chassis above said conveyor and adjacent said conveyor discharge side, said cutting means extending in the travel direction for cutting the hay-like material in the travel direction to a substantially constant depth;

a rotary distributor member having a plurality of projecting teeth, rotatably mounted to said chassis adjacent said conveyor discharge side and laterally outwardly of said cutting means for distributing hay-like material from said trailer lateral side as the hay-like material comes from said conveyor;

a first arm pivotally mounted to said chassis about an axis extending substantially in the travel direction;

a second arm pivotally mounted to said first arm adjacent one end of said second arm and about a pivot axis extending substantially in the travel direction;



a pivot member extending in the travel direction connected to an opposite end of said second arm;

said first and second arms pivotable to move said pivot member laterally of said trailer for engaging a cylindrical bale adjacent the central axis thereof, said first and second arms pivotable to bring said pivot member into a position above said conveyor for positioning a cylindrical bale on said conveyor;

a first double acting hydraulic cylinder connected between said first arm and said chassis and a second double acting hydraulic cylinder connected between said first arm and said second arm, said first and second hydraulic cylinders operable to move said first and second arms and said pivot member; and

drive means connected to said first and second hydraulic cylinders, said conveyor, said distributor means and said cutting means for activation thereof.

4,360,168

ROTARY BLADE ASSEMBLY FOR PELLETIZER ASSEMBLY

Russell I. Peterson, Jr., Oil City, Pa., assignor to Conair, Inc., Franklin, Pa.

Continuation of Ser. No. 972,065, Dec. 21, 1978, abandoned. This application Jun. 27, 1980, Ser. No. 163,435
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—294 **9 Claims**

1. An elongated rotary blade assembly of the type received within respective ones of a plurality of circumferentially spaced outwardly open elongated channels extending across and inwardly of the face of a rotary member of a pelletizer to form a cutting circle of blades to cooperate with a bed knife structure for pelletizing material upon rotation of the rotary member and wherein each rotary blade assembly includes a pair of circumferentially spaced elongated cutting blades seated on respective circumferentially spaced sides of one of such channels with the ends of such blades located inwardly of such one channel being spaced from the bottom of such one channel to provide an inner side surface portion of such one channel and with an elongated retaining wedge member dis-

posed between opposed surfaces of the blades for retaining the blades within the rotary member, the improvement comprising:

said wedge member including a first blade bearing surface engaging one of said opposed surfaces; said wedge member including a second blade bearing surface engaging the other of said opposed surfaces; and said wedge member having a third surface engagable with the inner side surface portion of such one channel inwardly adjacent the inner end of said one of said blade members.

4,360,169

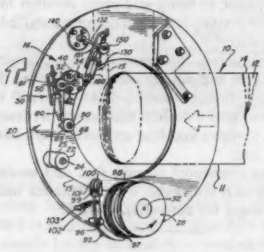
CABLE TENSIONING AND APPLYING APPARATUS

Samuel B. Stevens, Pekin, and Richard W. Kizer, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 91,677, which matured from PCT/US79/00483 filed Jul. 9, 1979, 102(e) date Jul. 9, 1979 now abandoned. This application May 8, 1980, Ser. No. 147,890

Int. Cl.[3] **B65H** *81/02;* **B29H** *17/02;* **H01F** *41/08*

U.S. Cl. 242—4 BE **3 Claims**



1. In an apparatus (16) for winding flexible elongate material (15) on a member (10) having a non-cylindrical cross-sectional shape which causes variations in the demand for elongate material being applied thereto, the apparatus including a shuttle (20), a supply (28) of elongate material (15) carried by the shuttle (20) and having tensioning means (95) for applying tension to the elongate material (15) drawn from the supply (28), the improvement comprising:

means (30,130) for storing and paying out elongate material (15) in response to the variations in the demand for elongate material, said means (30,130) being independent of said tensioning means (95) and including

an arm (32,132) pivotally mounted at one end portion of said shuttle and extending from said pivot mounting toward a mid portion of the shuttle,

a housing (44,144) supported on a free end portion of said arm (32,132),

sheave means (50,150) rotatably supported on the housing (44,144) at a location spaced from said pivot mounting,

said arm having its longitudinal axis extending from said pivot mounting toward said mid-portion of the shuttle and approaching a radius of the shuttle to minimize centrifugal forces acting on said sheave means (50,150) as the shuttle is rotated,

an energy-dissipating member (80,180) carried by said shuttle (20), a probe (82,182) on said energy-dissipating member (80,180) projecting toward said housing (44,144) on the side of said housing facing said supply of elongate material,

resilient means (84,184) for urging said arm (32,132) and sheave means (50,150) about said pivot mounting away from said supply of elongate material for storing elongate material, said resilient means (84,184) being carried on said energy-dissipating member (80,180) and bearing on said housing (44,144), said resilient means (84,184) being compressed by an increase in the tension of said elongate material thereby moving said housing against said resilient means and selectively contacting the probe (82,182) of the energy-dissipating member (80,180), and

a bumper (66,166) carried by said shuttle (20) in alignment with said housing (44,144) on the opposite side of the housing (44,144) from said resilient means (84,184), said housing (44,144) being moved by said resilient means (84,184) away from said supply of elongate material and against said bumper (66,166) upon sudden release of the tension on the elongate material (15),

said resilient means (84,184) maintaining said elongate material under uniform tension as said elongate material (15) is pulled from said supply (28) about said sheave means (50,150) and is applied to said member (10) as the shuttle (20) is rotated about said member (10).

4,360,170

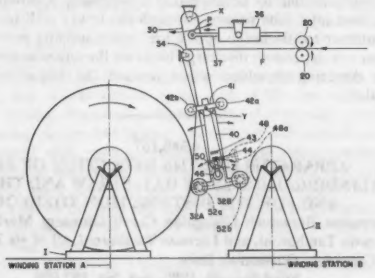
ROLL WINDER FOR LARGE DIAMETER ROLLS

Milton C. Kuklies, Temple, Tex., and George J. Reimann, Pittsford, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,714

Int. Cl.[3] **B65H** *19/20*

U.S. Cl. 242—56 R **4 Claims**



1. An apparatus for winding a continuously-fed malleable sheet material comprising: a roll feed mechanism for directing said sheet material from a sheet producing source; first and a second winding stations at which winding spindles are positioned on spindle stands for receiving the continuously fed sheet; a sheet directing main frame movably mounted directly downstream of said feed mechanism in the sheet feeding direction and being located intermediate said first and second winding stations for receipt of said sheet material from said feed mechanism and adapted to guide said material to respectively one of said first and said second winding stations; a sheet transfer means rotatably mounted on an intermediate portion of said main frame, said sheet passing through said transfer means during conveyance to one of said winding stations; an external control means connected to said transfer means activatable to rotate said transfer means away from one of said winding

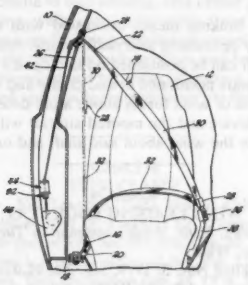
stations to the other of said winding stations and to transfer said sheet from the spindle located at one of said stations to the spindle located at the other of said stations, said main frame comprising a frame body having a first end at which said frame is rotatably mounted and a second end; a main frame biasing means selectively forcing said second end of said frame body in a direction towards one of said first and said second winding stations; and first and second sheet lay-on rolls mounted on said second end whereby said first lay-on roll forms a pressure nip with the spindle at said first winding station when said biasing means forces said second end toward said first winding position and said second lay-on roll forms a pressure nip with the spindle at said second winding station when said biasing means forces said second end toward said second winding position.

4,360,171

SEAT BELT RETRACTING AND LOCKING MECHANISM

Kenneth H. Reid, Mt. Clemens, and Bernard J. Finn, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1980, Ser. No. 202,494
Int. Cl.³ A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.2 **1 Claim**



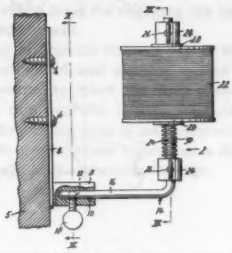
1. A restraint belt retracting mechanism comprising:
a cable attached to the end of the restraint belt;
a spring biased reel mounted on the vehicle body and adapted to extend and retract the belt by winding and unwinding the cable;
a housing mounted on the vehicle body and having the cable passing therethrough;
a radially contractable collet having an axially extending cable passage therethrough defined by passage walls normally spaced from the cable to permit cable passage therethrough during belt extension and retraction, said collet having opposed facing angularly inclined outer walls facing the housing;
first and second rollers interposed between the housing and the collet outer walls;
adjusting screw means threadably engaging the housing and effective to adjust the position of the first and second rollers relative the angularly inclined outer walls on the collet;
inertia sensing means responsive to vehicle deceleration adapted to effect relative axial movement of the collet relative the first and second rollers whereby the rollers coact with the outer walls to radially contract the collet to grip the cable; and
the imposition of occupant restraint load on the cable inducing cable and collet movement relative the first and second rollers whereby the collet is progressively contracted to progressively grip the cable against movement in the belt extending direction.

4,360,172

LINE WINDING DEVICE FOR FISHING REELS

James R. Cope, 10500 Cherokee La., Leawood, Kans. 66206

Filed Dec. 31, 1980, Ser. No. 221,545
Int. Cl.³ B65H *49/06, 49/26*
U.S. Cl. 242—129.8 **1 Claim**



1. A line winding device for fishing reels comprising:
a. a base member adapted to be affixed to a generally vertical support,
b. a spool bar adapted for the mounting thereon of a spool of bulk fishing line for axial rotation relative to said support, from which spool said line may be paid out to a fishing rod and reel combination, said spool bar constituting an angled bar having right-angled first and second legs,
c. connecting means joining said spool bar to said base and comprising a stud affixed to said base member and having an outwardly opening first bore formed therein for receiving the free end portion of the first of said bar legs slidably and rotatably therein, said spool being mountable for axial rotation on the second leg of said bar, said first leg extending generally horizontally outwardly from said support, whereby by turning said first leg in said stud said spool may be positioned selectively in either of two relatively reversed horizontal positions, or in either of two relatively reversed vertical positions, all of said horizontal and vertical positions lying in a generally vertical plane, said stud being provided with a second bore disposed horizontally and at right angles to said first bore, the first leg of said spool bar being insertable alternatively in said second bore, whereby the spool carried by said second bar leg is so disposed that line is paid out over the end of said spool in a direction parallel to its axis, and
d. means operable to fix said first bar leg in said stud at any desired angular position in the rotation thereof.

4,360,173

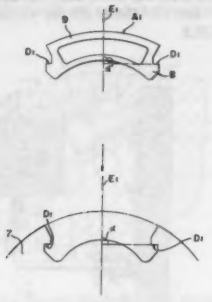
MAGNETIC TAPE CASSETTE

Shigemasa Shoji, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,457
Claims priority, application Japan, Sep. 9, 1979, 54/124289[U]
Int. Cl.³ G03B *1/04*; G11B *15/32, 23/04*
U.S. Cl. 242—199 **6 Claims**

1. A magnetic tape cassette comprising:
a magnetic tape and first and second reels for winding said magnetic tape which are held in a casing wherein each of said reels further comprises a reel substrate, a detachable tape clamping member having a first arcuate, radially internal rib and a second arcuate, radially external rib and which is detachably fitted to said reel substrate, wherein said tape clamping member further comprises a first and second jaw for engaging said reel substrate and wherein

an exterior angle between a prolonged line of a contact surface of said jaw and an axial line of symmetry dividing



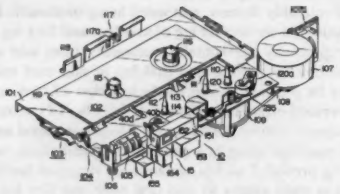
said tape clamping member into two parts is less than 90 degrees on said jaw.

4,360,174

CASSETTE TAPE RECORDER

Seiji Tomita, Yokosuka, and Hideo Yokoyama, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 24, 1980, Ser. No. 162,446
Claims priority, application Japan, Jun. 29, 1979, 54-89362[U]
Int. Cl.³ G03B *1/04;* G11B *15/32*
U.S. Cl. 242—200 **8 Claims**



1. In a cassette tape recorder comprising a locking mechanism for locking an enabling operation means for keeping a tape recorder mechanism in a desired operation mode, a stop operation means for releasing the lock effected by the locking mechanism and for bringing said tape recorder mechanism to a stop mode, and an ejecting means for ejecting a cassette tape to an ejected position; the improvement which comprises an ejection control mechanism which is non-engageable with respect to said ejecting means when said enabling operation means is locked and which is engageable when said enabling operation means is not locked, said ejection control mechanism operating the ejecting means to eject the cassette tape through the locking mechanism when it is engageable and when said stop operation means is operated.

4,360,175

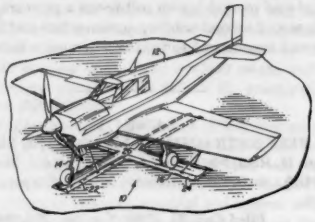
AIRCRAFT WEATHER VANE MOORING DEVICE

Howard M. Mellblom, 3408 Luckie Rd., Cheyenne, Wyo. 82001, and John M. Maxwell, 504-C Salem Ct., Cary, N.C. 27511

Filed May 8, 1980, Ser. No. 147,938
Int. Cl.³ B64F *1/12*
U.S. Cl. 244—115 **6 Claims**

1. An aircraft weather vane and mooring device to receive an aircraft to permit it to weather vane on a surface under the influence of prevailing wind, said device comprising:

(a) a turntable having a first and second pair of crossarms intersecting and arranged generally perpendicular one to the other, said first pair of crossarms having an upper surface, opposite edges and a bottom having roller means associated therewith for supporting said first pair of crossarms for rotation upon a surface, said upper surface being configured defining a cradle and having a downwardly inclined ramp at each edge between the sides of the cradle and the edge of the crossarms, said second pair of crossarms defining a generally longitudinally extending trough and having a bottom with roller means associated therewith for supporting said second pair of crossarms for rotation upon a surface;



(b) a shaft depending from said turntable at the intersection of said crossarms and supporting said turntable for rotation; and

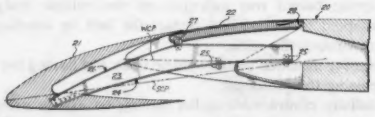
(c) friction braking means associated with said shaft and releasably restraining said shaft against rotation whereby an aircraft can be positioned on said device with the main landing gears positioned in said cradle and whereby upon application of wind forces above a pre-determined velocity said device and the moored aircraft will be caused to rotate into the wind about said shaft and on said surface.

4,360,176

WING LEADING EDGE SLAT

Robert B. Brown, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 5, 1979, Ser. No. 91,026
Int. Cl.³ B64C *3/50*
U.S. Cl. 244—214 **25 Claims**

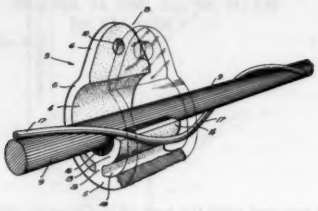


1. A leading edge high-lift generating device for an airfoil, comprising: a spanwise segment forming the nose structure of the airfoil, and having both an upper and a lower trailing edge surface faired into the cross-sectional configuration of the airfoil, without any aerodynamic surface discontinuities, when in a fully retracted and stowed position; a cam track mechanism operatively connected to said spanwise slat segment for curvilinear extension movement thereof from a stowed position to a forward and downward extended operative position relative to the airfoil; a spanwise panel member being exposed by forward curvilinear extension of the spanwise slat segment from the stowed position and being hinged spanwise along its trailing edge to the airfoil; said cam track mechanism being operatively connected to the leading edge of said spanwise panel member for supportably guiding said spanwise panel member, during forward extension movement of said spanwise slat segment, to a position for forming an aerodynamically continuous surface contour between said spanwise slat segment and the airfoil during extension of said spanwise slat segment from the stowed position.

4,360,177
SUSPENSION CLAMP

Philip W. Dulhunty, Greenwich, Australia, assignor to Dulmison (Australia) Pty. Limited, Australia

Filed Dec. 19, 1980, Ser. No. 218,581
Claims priority, application Australia, Jan. 8, 1980, PE1937
Int. Cl.³ F16L *3/00*
U.S. Cl. 248—63 **36 Claims**

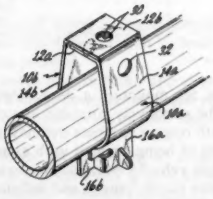


1. A suspension clamp for an electrical conductor or other filamentary member comprising an open-sided housing adapted to be presented transversely to a conductor to extend at least partially around it, said housing being adapted for securement to a support, a conductor-engaging cradle having a substantially U-shaped transverse cross-section, a web fixedly securing said cradle to said housing, said cradle provided with axially extending walls spaced inwardly from said housing, said housing and cradle being adapted to accept a plurality of helical conductor clamping rods between said housing and said cradle for surrounding and providing clamping force between a conductor and said cradle thereby to secure the conductor to said clamp.

4,360,178
PIPE CLAMP

Robert Senter, 230 Termino, Long Beach, Calif. 90803, and Millard Andrich, 3265 W. Lambert La., Tucson, Ariz. 85704

Continuation-in-part of Ser. No. 865,958, Dec. 30, 1977, Pat. No. 4,157,800, which is a continuation of Ser. No. 712,234, Aug. 6, 1976, abandoned. This application Feb. 28, 1979, Ser. No. 16,312
Int. Cl.³ F16L *3/08, 3/10*
U.S. Cl. 248—74 R **16 Claims**



1. An element of a clamp suitable for affixing a pipe to a wall, ceiling or other structural component, the clamp being of the type consisting of two associated elements disposed on opposite sides of the pipe and facing each other, extending circumferentially around the pipe and interlocking to embrace the pipe to secure it to the structural component, each of the two associate elements including a first end portion, a midsection, and a second end portion, the two associated elements having identical second end portions, said element comprising in combination:

a stiff non-planar sheet-like unitary structure of uniform thickness, having a first end portion, a midsection, and a second end portion;

said first end portion including couplings means for interconnecting said first end portion with the first end portion of the associated element;

said midsection shaped to contact the pipe and to extend circumferentially partially around the pipe;

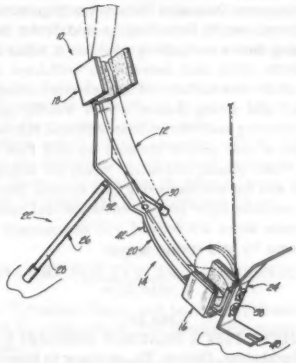
said second end portion disposed to extend outwardly from the pipe when said element is applied to the pipe, and including a locking edge extending parallel to the pipe and further including a tab extending from said second end portion toward the associated element in a plane perpendicular to the pipe, said tab including a ramp relieved by a recess to provide a hook for engaging the locking edge of the associated element;

said element being sufficiently resilient that as the opposite second end portions of said element and an associated element are squeezed together, the ramp of each element is deflected to ride over the locking edge of the other element until the locking edge of each element snaps into the recess of the other element to produce a double interlocking of the elements embracing the pipe.

4,360,179
ARCHERY BOW STANDS

Theodore E. Roberts, 412 W. Main, Manchester, Mich. 48158

Filed Jun. 30, 1980, Ser. No. 164,834
Int. Cl.³ A47G *29/00*
U.S. Cl. 248—126 **8 Claims**

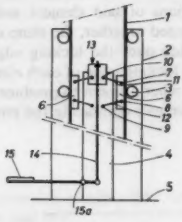


1. A stand for an archery bow comprising a frame assembly having receptacle means for receiving and supporting a bow in an upright position, and a leg assembly connected to the frame assembly for supporting the frame assembly in selectedpositions on a supporting surface and so that a bow supported in the receptacle means will be generally upright, characterized in that one of said leg and said frame assemblies includes a rear leg means for engagement with said supporting surface, and said leg assembly has forward leg means with an upper end thereof connected to a mid-portion of said frame assembly and a lower end thereof for engagement with said supporting surface and in that said forward leg means is connected at its upper end to said frame assembly by a first swivel connection and at its lower end to said supporting surface by a second swivel connection, said first and second swivel connections having vertical axes out of vertical alignment with each other so that the upper swivel connection can be rotated in a circle around said lower swivel connection for positioning purposes.

4,360,180
DEVICE FOR LOCKING THE DRAWING BOARD OF A DRAWING TABLE ASSEMBLY

Alain Bruneau, Montferrand le Chateau, France, assignor to Jeandal, France

Filed Feb. 11, 1980, Ser. No. 120,297
Claims priority, application France, Feb. 12, 1979, 79 03926; Jul. 26, 1979, 79 19256
Int. Cl.³ A47F 5/12
U.S. Cl. 248—162.1 **10 Claims**



1. In a drawing table assembly comprising a drawing board mounted on a support column guided for vertical movement in a pedestal structure and supported by a cable passing over a pulley biased in a direction to counterbalance the weight of the drawing board, a safety device comprising a vertical inner support member inside said column, brake means comprising brake shoes mounted by linkage on opposite sides of said inner support member and engageable with inner surfaces of opposite sides of said support column, spring means acting on said brake shoes to press them into frictional engagement with said support column, means for releasing said brake means, said brake releasing means comprising a release member connected with said brake shoes and movable to withdraw said brake shoes from said inner surfaces of said support column against the action of said spring means, a foot treadle, and control member connecting said foot treadle with said release member for operation of said release member by said foot treadle to release said brake means, and safety means for sensing tension in said cable and for disconnecting said control member from said release member upon loss of tension in said cable, whereupon said brake shoes are pressed into engagement with said support column by said spring means.

4,360,181
THREE-PIECE BRACKET ASSEMBLY

Harvey Z. Burkholder, Denver, Pa., assignor to Favorite Manufacturing, Inc., New Holland, Pa.

Filed Mar. 9, 1981, Ser. No. 241,630
Int. Cl.³ A47G 29/02
U.S. Cl. 248—248 **7 Claims**

1. A three-piece bracket assembly capable of being erected without separate fasteners, comprising:

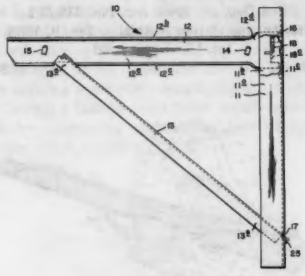
an upright having vertically spaced holes;

a laterally-extending arm having hook means at one end engaged in one of said holes in said upright and having a downwardly open notch spaced from said hook means;

a brace having one end received in said notch in said arm and extending at an angle between said arm and said upright;

cooperating latching means on one end of said brace and in said arm notch operable to interlock the brace and arm upon engagement of the brace with the arm and rotary motion of the brace into an acute angle relative to the arm, said cooperating latching means including a shoulder in said arm notch and a turned tip on said one end of said brace engaging said shoulder; and

means on the other end of said brace providing a tang extending through the other one of said holes in said upright

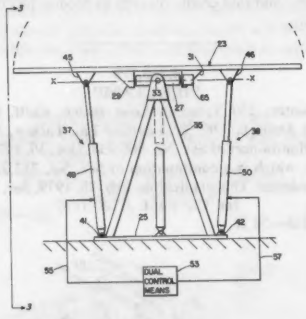


and engaged with the web of said upright adjacent said other one of said holes to lock the brace to the upright.

4,360,182
HIGH-AGILITY REFLECTOR SUPPORT AND DRIVE SYSTEM

James W. Titus, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 25, 1980, Ser. No. 163,000
Int. Cl.³ A47G 29/00
U.S. Cl. 248—371 **8 Claims**



1. Apparatus for mounting a device defining a mounting plane so as to be selectively rotatable about mutually perpendicular axes with respect to a base defining a base plane and so as to be capable of being pointed with extreme accuracy and moved with high velocity or rapid acceleration, comprising:

four suspension points lying in and defining each of the base and mounting planes, the suspension points in each of the planes arranged in like geometric symmetry and defining rhombi lying in each of the planes;

four support-arm members joining the base and mounting planes and terminated at opposed pairs of suspension points in the planes, each support-arm member including a linear actuator and having first and second joints at its respective ends;

a gimbal having a longitudinal rotation axis;

means for rotatably mounting the gimbal to the mounting plane such that the longitudinal rotation axis of the gimbal passes through the first joints associated with one pair of diagonally opposite support-arm members;

a pin fitted transversely to the gimbal and having a longitudinal rotation axis; and

means for rotatably mounting the pin to the base lane such that the longitudinal rotation axis of the pin passes

through the first joints associated with the other pair of diagonally opposite support-arm members when the base and mounting planes are parallel.

4,360,183

RETAINING DEVICE FOR SHEET MUSIC

Americole R. Biasini, Bellingham, Wash., assignor to Allsop, Inc., Bellingham, Wash.

Filed Jun. 24, 1980, Ser. No. 162,520
Int. Cl.³ A47B 97/04
U.S. Cl. 248—451 **7 Claims**

1. A retaining device adapted to be mounted to a music stand, having a back panel portion and a lower support flange extending outwardly from a lower part of the panel portion, in a manner to support sheet music on the stand, said device comprising:

(a) a retaining arm having an upper end and a lower end, and adapted to be located in an upright retaining position to press said sheet music on the stand against the panel portion,

(b) an upper mounting flange having an inner end connected to the lower end of the retaining arm, and an outer end extending outwardly from the retaining arm, and adapted to be positioned over the support flange of the stand,

(c) a lower mounting flange having an outer end operatively connected to the outer end of the upper mounting flange and an inner end extending towards the inner end of the upper flange, and adapted to be positioned below the support flange of the stand,

(d) said mounting flanges being arranged to grip the support flange of the music stand in a manner to hold the retaining arm in its retaining position,

(e) said upper and lower flanges being operatively connected to one another at a hinge connection which permits moderate rotational movement between the upper and lower mounting flanges,

(f) said upper and lower flanges being so arranged that said hinge connection is a tongue and groove connection, comprising a tongue member mounted to one of the mounting flanges, with the other of the mounting flanges being formed with a matching groove,

(g) spring means engaging the upper and lower mounting flanges to urge the inner ends of the mounting flanges toward one another.

4,360,184

PNEUMATIC DEVICE FOR ATTENUATION OF VERTICAL, HORIZONTAL AND ROTATIONAL DYNAMIC FORCES

Willis J. Reid, III, Maynard, Mass., assignor to Technical Manufacturing Corporation, Woburn, Mass.

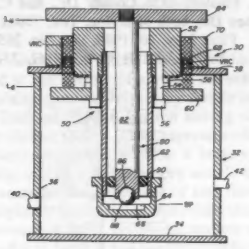
Filed Feb. 19, 1980, Ser. No. 122,131
Int. Cl.³ F16M 13/00
U.S. Cl. 248—573 **8 Claims**

1. In an air isolation system wherein a horizontal surface is isolated from vibrational forces by being supported by pneumatic piston assemblies which assemblies each have a loading chamber and a damping chamber, the chambers being pressurized, the improvement of the pneumatic piston assembly comprising:

(a) a loading chamber;

(b) an annular piston flexibly received in the chamber in a pressure-tight manner, said piston including a piston well which well includes an upwardly facing bearing surface in its depending end;

(c) an annular diaphragm to secure flexibly the piston in the chamber, the piston supported by the pressure in the chamber, the chamber and the piston adapted for movement one relative to the other with reference to a vertical roll center in a region of vertical roll;



(d) an elongated load support member which passes through the piston and pivotally engages the bearing surface of the piston well below the region of vertical roll to allow relative pivotal movement between the piston and load support member, the upper end of the support member including a support plate to support a load to be isolated; and,

(e) means to limit the vertical movement of the first and second members respectively between upper and lower limits of the region of vertical roll;

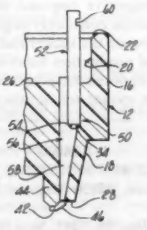
whereby forces acting on the chamber will be substantially absorbed by the first member which will move relative to the position of the second member thereby isolating the second member and the supported load from said forces.

4,360,185

MOLD CORE FOR ELECTRICAL CONNECTOR ASSEMBLY

Richard W. Normann, Otego, and Leroy W. Fairbairn, Sidney, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 116,055, Jan. 28, 1980, abandoned. This application Apr. 20, 1981, Ser. No. 255,199
Int. Cl.³ B29C 1/00; B29F 1/00
U.S. Cl. 249—175 **2 Claims**



1. An apparatus adapted for use in making a molded electri-

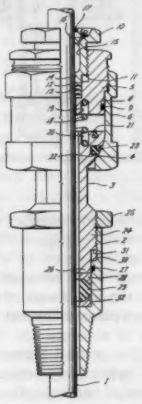
cal connector having a passage with an integral shoulder with the passage, said apparatus comprising a core pin having an elongated body, a radially extending rib mounted to the body, said rib having a tapered end portion extending beyond one end of the body, said body shaped to define a channel portion of the passage extending along a first longitudinal axis when molded and said tapered end portion shaped to define a tapered part of a groove portion of the passage extending along a second longitudinal axis from the end of the channel portion defined by the one end of the body when molded, said first and second longitudinal axes being angled with respect to one another.

4,360,186

SWIVEL JOINT

William B. Tinsley, 1926 Colony Dr., and C. Richard Bacon, 2102 Vanco Dr., both of Irving, Tex. 75061

Filed Nov. 10, 1980, Ser. No. 205,096
Int. Cl.³ E21B *33/06*; E16L *27/06*
U.S. Cl. 251—1 B **5 Claims**



1. In a swivel joint for use in pumping wells, an upper and lower annular member, each having a face thereon, connecting means for connecting said members with said faces opposed to each other and maintaining said members in position on a well head, said upper and lower annular members and connecting means having aligned bores extending therethrough in which a sucker rod is positioned for reciprocation, said bores and sucker rod defining an annulus therebetween, said upper member having packing means sealing the annulus between the sucker rod and the upper member, the upper portion of the lower annular member having an external curved surface and the internal wall of the connecting means being internally curved forming a line contact with said externally curved surface of said lower annular member, a yieldable means mounted in the respective opposed faces of the upper and lower annular members constantly urging said members apart and the annulus between the sucker rod and the lower member admitting a flow of production fluid under pressure into the area between said opposed faces to assist in maintaining said annular members in spaced relationship.

4,360,187

COMPACT HOISTING DEVICE

Leonard T. Chapman, 12950 Raymer St., North Hollywood, Calif. 91605

Filed Jun. 19, 1981, Ser. No. 275,267
Int. Cl.³ B66F *3/00*
U.S. Cl. 254—8 R **11 Claims**

1. A hoisting mechanism for projecting a load along a substantially linear travel path by means of a train of elongated hoist links sequentially pivoted to one another, comprising:

a base;

a primary link, pivotably attached to said base;

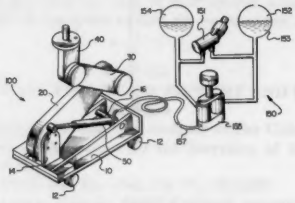
a final link, operatively connected to said primary link;

motion transmission means, to project and rotate said final link such that the angular travel of said final link substantially equals the absolute value of the angular travel of said primary link;

a load support, pivotably mounted on said final link;

positive attitude control means, independent of said motion transmission means, to maintain a constant spatial attitude of said load support, with respect to said base; said positive attitude control means including:

a cross-shaft, coaxial with a hinge axis passing through the outboard end, remote from said base, of said primary link and the inboard end, remote from said load support, of said final link;



journal means, allowing for the free rotation of said cross-shaft independent of the position of either hoist link;

a load support shaft integral with said load support and parallel to said cross-shaft;

a pivot shaft, irrotatably fixed in said base;

a primary mechanical position control drive operatively interconnecting said pivot shaft with said cross-shaft, said primary mechanical position control drive incorporating parallel drive rods pinned to planarly aligned disks keyed, respectively, to said horizontal pivot shaft and to said cross shaft;

a final mechanical position control drive, operatively interconnecting said cross-shaft with said load support shaft, and

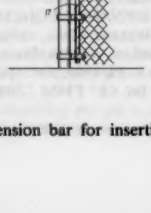
actuator means, for impelling said primary link into rotational movement about said pivot axis, thereby elevating said load support.

4,360,188

TENSION BAR FOR CHAIN LINK FENCE

Andrew C. Craft, Carmel, Ind., and Robert H. Hill, Chicago, Ill., assignors to Delta Cube, Inc., Denver, Ind.

Filed Sep. 8, 1980, Ser. No. 185,329
Int. Cl.³ E04H *17/10*
U.S. Cl. 256—47 **3 Claims**



1. An elongated tension bar for insertion in the bight of

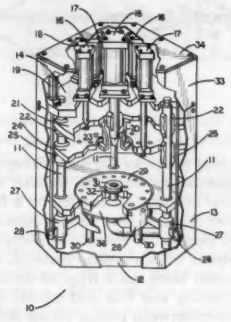
aligned, generally U-shaped portions of the terminal links of a chain-link fence, said bar being tubular and oblong in cross-sectional configuration and having a curvature about its major cross-sectional axis which substantially matches the curvature at said bight of the terminal links of the fence to provide the maximum distribution of compressive stress along said major axis, said bar being sealed at each end to prevent moisture access to its interior and having its terminal corners rounded to facilitate insertion in said aligned terminal link openings.

4,360,189

QUENCH PRESS

James P. Duncan, P.O. Box 6069, Spartanburg, S.C. 29304, and James L. Lawson, 7300 Cedar Post Rd., Bldg. I-23, Liverpool, N.Y. 13088

Filed Jul. 28, 1980, Ser. No. 172,865
Int. Cl.³ C21D *9/32*
U.S. Cl. 266—118 **18 Claims**



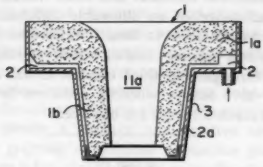
1. An improved quench press comprising:
(a) a frame, said frame including a base, a top plate spacially separate from said base and a plurality of elongated support elements secured therebetween;
(b) a first ram plate received between said top plate and said base and being associated with said support elements for aligned reciprocal movement therealong, said ram plate defining a passageway therethrough that is concentric to a vertical axis through said frame, said ram plate further having an annular collar secured to an underside of same, said collar being adapted for securement to a die of a predetermined design along an outer free end of same;
(c) a plurality of power exerting means associated with said ram plate to move said plate along said support elements and to apply pressure against a workpiece contacted by said die, said power exerting means for said plate being spaced about a circle concentric to said vertical axis;
(d) a central power exerting means located along said vertical axis and having a central ram operatively associated therewith for reciprocal movement with respect thereto, said central ram being operatively associated with said passageway for aligned reciprocal movement and having a generally conical shaped lower free end;
(e) a stationary workpiece support plate secured to said frame, said support plate being adapted for receipt of a lower die plate for said workpiece and being adapted for passageway of quench fluid therethrough;
(f) positive central ram stop means associated with said workpiece support plate along said vertical axis and operating independent of a workpiece being quenched;
(g) means operable to enclose an area around said workpiece support plate to define a quench chamber therewithin; and
(h) means to supply quench liquid to said quench chamber for cooling a workpiece held between said rams and said workpiece support plate.

4,360,190

POROUS NOZZLE FOR MOLTEN METAL VESSEL

Junichi Ato, 21, Maborikaigan, 2-chome, Yokosuka-shi, Kanagawa-ken, Japan

Filed Mar. 16, 1981, Ser. No. 243,898
Int. Cl.³ C21C *5/48*
U.S. Cl. 266—220 **3 Claims**



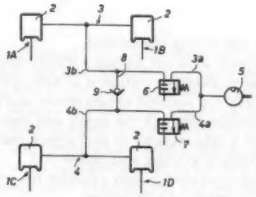
1. A refractory porous nozzle assembly which is adapted to be positioned at the bottom of a vessel for containing molten metal, comprising a porous refractory nozzle body including a generally cylindrical flanged portion having an upper surface and a lower surface, and a lower tapered cylindrical portion having an outer peripheral surface; a hollow metallic outer shell enclosing said porous refractory nozzle body; a first gas conduit between the lower surface of said flange portion and the inner peripheral surface of said metallic shell; a second gas conduit between the outer peripheral surface of said lowered tapered cylindrical portion and the inner surface of said metallic shell; and at least one gas feed line in communication with at least one of said first and second conduits.

4,360,191

AIR-LEVELING SYSTEM FOR A VEHICLE

Goro Urushiyama, Odawara, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,482
Claims priority, application Japan, Dec. 6, 1979, 54-169034[U]
Int. Cl.³ B60G *19/08*
U.S. Cl. 267—64.16 **8 Claims**



1. An air-leveling system for a vehicle having front and rear wheels, comprising:
shock absorber means for respectively suspending both said front and rear wheels;
air source means;
air chamber means provided in each said shock absorber means;
first conduit means for feeding pneumatic pressure from said air source means to said air chamber means of said shock absorber means of said front wheels;
second conduit means for feeding pneumatic pressure from said air source means to said air chamber means of said shock absorber means of said rear wheels;
at least one check valve means, provided in third conduit means for providing communication between said first feeding conduit means and said second feeding conduit means;

said check valve means being normally closed when the pressures in said first conduit means and said second conduit means are substantially balanced; and

wherein said check valve means moves to an open position thereof when said pressure in said air chamber means of said shock absorber means of said rear wheels becomes higher than pressure in said air chamber means of said shock absorber means of said front wheels over a predetermined range of an allowable difference in pressure between them, so as to directly release an excessive pressure in said second conduit means to said first conduit means through said third conduit means and said open check valve means, whereby pressures in said first and second conduit means are balanced.

4,360,192

GAS SPRING, FILLING AND SEALING STRUCTURE

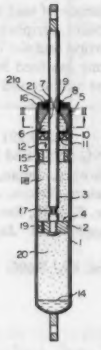
Kunio Ishida, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Nov. 3, 1980, Ser. No. 203,365

Claims priority, application Japan, Nov. 9, 1979, 54-155611[U]

Int. Cl.³ F16F 9/43

U.S. Cl. 267—64.28 **5 Claims**



1. A gas spring comprising:

a vertical cylinder having a closed lower end;

a piston slidably positioned in said cylinder;

a piston rod secured to said piston and extending out or said cylinder through the upper end thereof;

a rod guide secured to said upper end of said cylinder for slidingly guiding said piston rod;

a stop provided in said cylinder for restricting the upward movement of said piston;

a first seal mounted on said rod guide and slidingly engaging with said piston rod to sealingly close the interior of said cylinder from the exterior;

at least two normally closed first passages provided in said rod guide for filling gas and, thereafter, oil into the gas spring;

a second seal provided between said rod guide and said stop and sealingly and slidingly engaging with said piston rod, said second seal being sealingly displaceable in said cylinder between an uppermost position abutting said rod guide and a lowermost position abutting said stop; and

a second passage formed between the inner circumference of said second seal and a portion of the outer circumference of said piston rod only when said piston rod is in the uppermost position thereof and said second seal is in said lowermost position thereof;

whereby, when filling oil into a space between said first and second seals, one of said first passages is utilized to introduce oil into said space while the other first passage is utilized to exhaust gas from said space.

4,360,193

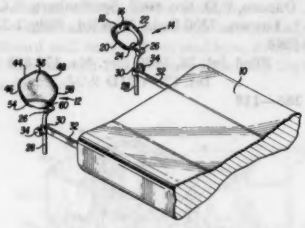
COVER FOR STIRRUP OF PHYSICIAN'S EXAMINATION TABLE

Winalee G. Mitchell, 110 Secor Woods La., Perrysburg, Ohio 43551

Filed Jun. 16, 1980, Ser. No. 159,974

Int. Cl.³ A61G 13/00

U.S. Cl. 269—328 **7 Claims**



1. An improved cover for use on a stirrup of the type found on medical examination tables and the like, such stirrup comprising a central opening surrounded by a frame having top, side and bottom elements, said cover comprising:

a first sheet element of elastomeric material and a second sheet element of elastomeric material, at least said first sheet element being made from an open-celled foam;

means for joining said first and second sheet elements to provide therebetween pocket means defined by an upper edge and side edges extending downwardly from said upper edge to a bottom edge in said second sheet element at the open mouth of said pocket means, said pocket means being for receiving at least a portion of the top element and a portion of the side elements of a stirrup of a medical examination table, said first sheet element extending beyond said bottom edge and the mouth of said pocket means and facing toward the examination table when the cover is slipped over a stirrup; and

means extending from said first sheet element toward the examination table for cushioning and protecting the heel of a patient against contact with the bottom element of a stirrup.

4,360,194

WEB UNIT HANDLING METHOD AND APPARATUS

John J. Bradley, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 86,158, Oct. 8, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 167,810

Int. Cl.³ B42C 1/10

U.S. Cl. 270—51 **6 Claims**

1. Apparatus for producing stacks of folded web units comprising a frame,

a collection conveyor horizontally disposed on said frame,

means operably associated with said collection conveyor for moving the same at a predetermined speed,

a plurality of cutoff-transverse folding devices successively aligned along said collection conveyor terminating in a discharge end, each said cutoff-transverse folding device including a folding roll having an outer surface,

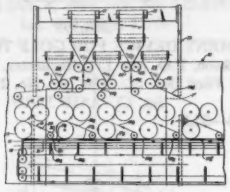
means associated with said folding rolls for rotating the same to move said surface at said predetermined speed,

means for separately, vertically advancing at said predetermined speed a plurality of continuous webs, one into each of said cutoff-transverse folding devices, said cutoff-transverse folding devices providing folded web units,

means for controlledly transferring said folded web units from each of said cutoff-transverse folding devices to a series of points on said collection conveyor for advancing units thereon in synchronism with the units being delivered successively thereto to develop a series of stacks, each stack having a plurality of units therein,

said transferring means including belt means for traveling on said folding roll in underlying relation to a web unit on said folding roll whereby said belt means travels at said predetermined speed,

each said belt means being entrained about an idler roll spaced downstream relative to the path of collection



conveyor movement from said folding roll to provide a length of travel generally parallel to said collection conveyor to confine each folded web unit as the same is superposed onto a previously transferred folded web unit,

said surface of each of said folding rolls, each said belt means and said collection conveyor all being arranged so that at the point of transfer of a folded web unit all of said folding roll surface, belt means, folded unit and collection conveyor are traveling at the same speed and in the same direction whereby a folded web unit traveling with said folding roll changes direction progressively during transfer without any change in speed.

4,360,195

DEVICE FOR ALIGNING AND FEEDING AN ORIGINAL

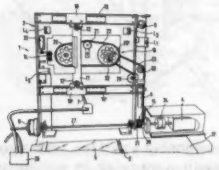
Klaus-Peter Schön, and Klaus Schmitt, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,968

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1979, 2947865

Int. Cl.³ B65H *5/10, 9/16, 9/20*

U.S. Cl. 271—3 **8 Claims**



1. A device for aligning and feeding an original from a feed station to an object stage in a copying machine, comprising:

a cover positioned above at least a portion of the feed station and the object stage;

a drivable feed roller associated with said cover in a position above the feed station to feed an original inserted onto the feed station, said feed roller being rotatable about an axis which is obliquely oriented with respect to the direction of transport of the original through the copying machine;

a plurality of sensors for detecting a plurality of positions of the original in the copying machine, including a first sensor for detecting the presence of an original in the feed station;

means for correctly aligning a leading edge and a leading corner of an original in the feed station, said aligning means including a front edge alignment member which is selectively movable upwardly and downwardly into and out of the transport path of the original;

means for temporarily driving said feed roller in response to detection of an original by said first sensor, to feed the original into correct alignment in said aligning means;

a transport device for an original, located in said cover, said transport device being movable back and forth between a first position located above said aligning means and a second position located above the object stage and including means for selectively and alternately supplying to said transport device a vacuum and positive air pressure, means for gripping an original by suction produced by said vacuum when the original is correctly aligned at said aligning means, and means for moving said transport device between said first and second position;

a second sensor located as said aligning means for detecting when an original is correctly aligned there; and means, responsive to a signal from said second sensor, for moving said front edge alignment member out of the transport path of the original.

4,360,196

SHEET-FEEDING ARRANGEMENT

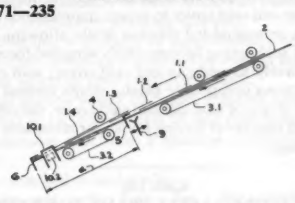
Günter Weisbach, Radebeul, German Democratic Rep., assignor to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jul. 17, 1980, Ser. No. 169,928

Claims priority, application German Democratic Rep., Aug. 7, 1979, 214721

Int. Cl.³ B65H *9/00*

U.S. Cl. 271—235 **7 Claims**



1. In a sheet-feeding arrangement, particularly for use in printing machines, a combination comprising a sheet-feeding table having a rear end and a front end; means for advancing a stream of overlapped sheets from said rear end towards said front end; preliminary sheet-aligning means rearwardly spaced from said front end, said preliminary sheet-aligning means including at least two stops laterally spaced from each other and stopping an individual sheet to be aligned and preliminary aligning its front edge at the stationary position thereof, said stops being arranged to pivot downwardly to allow the preliminary aligned sheet to be further advanced towards said front end, said advancing means further advancing the preliminary aligned sheet towards said front end; and final sheet-aligning means at said front end, said preliminary and final sheet-aligning means being spaced from one another in the direction of sheet advancement by a distance which is at least equal to the length of the individual sheets of said stream.

4,360,197

SPRING ASSEMBLY FOR A TUMBLING BOARD

Leonard H. Palmer, 1168 Westwood Trail, Addison, Ill. 60101

Filed Jun. 30, 1980, Ser. No. 164,587

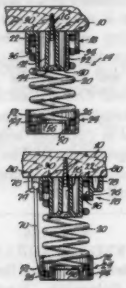
Int. Cl.³ A63B *5/18*

U.S. Cl. 272—65 **13 Claims**

1. A spring assembly for supporting a tumbling board comprising:

a helical spring;

a mounting cap formed of resilient material receiving one end of said spring and having a flat base for abutment with the underside of a tumbling board, a generally cylindrical projection extending from one side of said base into the interior of said spring one end, an annular lip spaced radially outwardly of said projection and extending from said base one side to define, with said projection, a groove for receipt of said spring one end, said groove narrowing as said base is approached such that insertion of said spring thereinto will cause said lip and/or said projection to deform so that the resilience of said material will cause said cap to grasp said spring one end,



and an aperture in said base for receipt of a fastener by which said cap may be secured to a tumbling board;

a protective cover received on the other end of said spring; and

collapsible connections of limited length interconnecting said cap and said cover to assure maintenance of said assembly in assembled relation while allowing compression of said spring by oppositely directed forces applied respectively to said cap and said cover, said collapsible connections comprising plastic straps formed integrally as part of one of said cap and said cover, the other of said cap and said cover having hooks for releasable receipt of said straps.

4,360,198

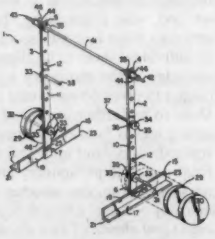
WEIGHT LIFTING SAFETY FRAME FOR EXERCISING

Larry Waulters, Rte. 1, Hallsville, Mo. 65255

Filed Feb. 6, 1981, Ser. No. 232,192

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—117 **18 Claims**



1. A weight lifting safety frame comprising:

(a) a pair of upright horizontally spaced standards; each of said standards having an upper and a lower end and inner and outer surfaces, said inner surfaces being in opposed facing relationship;

(b) a pair of horizontally spaced bases for engaging a support surface; each of said bases attached to a respective standard lower end;

(c) a pair of rods positioned near the lower ends of the standards; each of said rods extending outwardly from a respective standard outer surface;

(d) a plurality of weighted plates; each said plate having an aperture therethrough for slidably receiving and being supported by only a respective rod; and

(e) said standard upper ends being interconnected by a generally horizontally aligned upper bar; said upper bar having a pair of opposed ends, each said end being attached to a respective standard upper end; said frame being liftable by a person grasping said upper bar intermediate said standard upper ends.

4,360,199

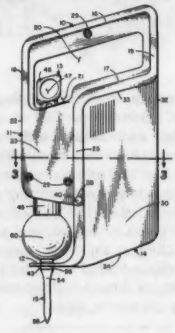
PLACEMENT DEVICE FOR GOLF TEE AND BALL

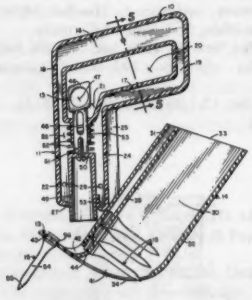
Andrew Jackson, P.O. Box 137, Rochester, Wash. 98579

Filed Dec. 22, 1980, Ser. No. 218,614

Int. Cl.³ A63B *57/00*

U.S. Cl. 273—32.5 **4 Claims**





1. A tool for positioning a golf tee, with a golf ball supported thereon, in the earth comprising, in combination:

a rigid handle communicating in its lower forward part with an elongate depending rigid body;

a peripherally defined magazine, carried by the body, having a transverse septum defining a vertical tee slot to receive and slidably maintain a golf tee and means to allow exit of a golf tee from the bottom thereof;

a holding mandrel, carried by the magazine, communicating with the lowermost portion of the transverse septum and extending under the body at a spaced distance therebelow, said holding mandrel having a tee slot defined therethrough to communicate with the tee slot defined in the transverse septum and to frictionally engage a tee therein but allow its passage therealong; and

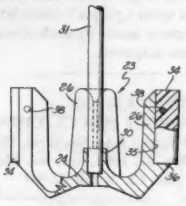
trigger mechanism carried by the body including a vertically moveable ball holding cylinder extending below the lowermost extension of the body, means of biasing the ball holding cylinder to a lowermost position and means of moving the ball holding cylinder upwardly against such bias.

4,360,200

GOLF FLAG STICK HOLDER

John A. English, Sausalito, Calif., assignor to Green-Gard Associates, Larkspur, Calif.

Filed Dec. 4, 1981, Ser. No. 327,419
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—34 R **6 Claims**



1. A golf flag stick holder for insertion into a golf cup, comprising:

a central member and a plurality of laterally extending arms with an upright finger at the outer end of each arm, and means for receiving a flag stick in said central member,

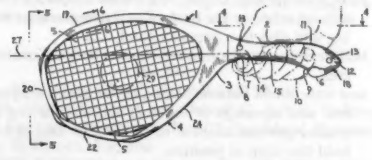
each of said fingers having a passage at the outer edge thereof with a plastic insert therein, with said insert defining the periphery of said holder for sliding insertion of the holder into and withdrawal from a golf cup.

4,360,201

RACQUETBALL OR TENNIS RACQUET

Roy J. Biehl, 1133 N. Water St., Milwaukee, Wis. 53202, and Kenneth L. Baron, Monroeville, Pa., assignors to Roy J. Biehl, Milwaukee, Wis.

Continuation of Ser. No. 17,433, Mar. 5, 1979, abandoned. This application Mar. 31, 1980, Ser. No. 135,225
Int. Cl.³ A63B *49/02*
U.S. Cl. 273—73 C **5 Claims**



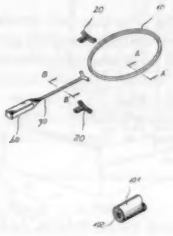
1. In a racquet having a frame providing a handle at the rear end and an enclosure at the forward end extending forwardly from a throat to which the handle is connected, said enclosure being constructed from suitable material in the general form of a polygon comprising a plurality of sections terminating into each other in an arc-like pattern with at least one of the sections substantially offset from a rotational balance line extending through the handle and projected through the enclosure of the frame to establish a greater web receiving area adjacent said offset section on the one side of the rotational balance line as compared to the web receiving area on the opposite side of said line, and webbing in the form of string-like material located inside the enclosure in the web receiving areas and secured to the enclosure of the frame of the racquet to provide a "sweet spot" substantially spaced from said frame sections and the difference in the extent of the web receiving areas providing a substantial increase in the amount of the webbing adjacent said offset section to supply an increased surface in the webbing in difficult return positions with which to engage the ball in play, said handle having a mass spaced from said enclosure to balance the weight of said greater web receiving area to permit substantial balanced use of said racquet with respect to the rotational balance line with an operator's hand totally spaced from said enclosure and said webbing.

4,360,202

CFRP OR FRP MADE BADMINTON RACKET FRAME

Kun-Nan Lo, No. 7-1, Lane 246, Section 3, Chung-Shan Rd., Tan Tzu Hsiang, Taichung Hsien, Taiwan

Continuation of Ser. No. 940,556, Sep. 8, 1978, abandoned. This application May 22, 1980, Ser. No. 152,400
Int. Cl.³ A63B *49/10*
U.S. Cl. 273—73 F **1 Claim**



1. A badminton racket frame comprising:

a closed ring frame including a solid ring of foamed material and an outer jacket of fiber reinforced plastic, said outer jacket completely jacketing said ring;

a shaft having a diameter of approximately one millimeter, said shaft including a solid rod of foamed material and an outer jacket of fiber reinforced plastic;

a throat portion where said shaft is butted against and connected to the outer jacket of said ring frame in coplanar relationship and forms a seamless connection therewith; and

a grip attached to said shaft;

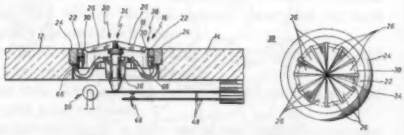
whereby said racket frame has a fiber reinforced plastic outer layer and a solid independent foamed material as the core thereof, said layer and core being closely and tightly constructed to form a seamless racket frame.

4,360,203

ROLLOVER SWITCH FOR PINBALL GAME

Roman F. Garbark, Westchester, Ill., assignor to D. Gottlieb & Co., Northlake, Ill.

Filed Sep. 8, 1980, Ser. No. 184,784
Int. Cl.³ A63F *7/00*
U.S. Cl. 273—121 A **43 Claims**



1. A ball actuated rollover switch for a shaped opening in a playfield of a pinball game, comprising:

(a) a plurality of yieldable surface-defining members which define the yieldable surface to be deformable between first and second shapes upon ball engagement with said surface, thereby to provide a surface region which travels in a direction substantially normal to the playfield a detectable distance upon ball engagement with said surface;

(b) structure configured to fit into said shaped opening for firmly supporting the periphery of said members at the level of the playfield ; and

(c) a detector disposed with respect to said surface for detecting said surface region travelling said detectable distance.

4,360,204

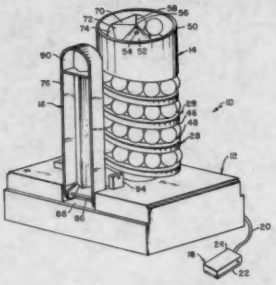
GOLF BALL STORAGE AND FEEDER DEVICE

Robert J. Karr, 1605 - 16th St., Wyandotte, Mich. 48192

Filed May 30, 1978, Ser. No. 910,297

Int. Cl.[3] A63B *57/00*

U.S. Cl. 273—201 17 Claims



1. A golf ball storage and feeder device comprising a vertical helical ramp for receiving golf balls which are to roll theredown in single file, a golf ball loading structure on the upper end of the ramp, passageway structure between the ramp and the loading structure, said golf ball loading structure including means to receive a plurality of golf balls and a plurality of baffle surfaces slanted at different angles downwardly toward said passageway structure to cause golf balls to roll toward said passageway structure and to prevent golf balls from jamming together while so rolling, an exit at the lower end of the ramp, and ball control means at said exit to cause one ball at a time to be released, said ball control means including actuating structure selectively actuable by a golfer to cause release of a ball when desired.

4,360,205

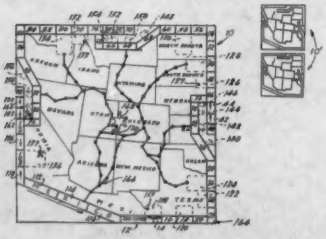
BOARD GAME WITH PLAYER CLAIM BOARDS

James C. Rimbold, 365 Clark St., Saline, Mich. 48076

Filed Jun. 23, 1980, Ser. No. 161,892

Int. Cl.[3] A63F *3/00, 3/04*

U.S. Cl. 273—256 8 Claims



1. A game board apparatus comprising a game board having means depicting a series of marked spaces defining a primary pathway extending in a closed loop about said game board, certain of said marked spaces along said primary pathway being designated as real property spaces, a set of tangible property tokens, certain of said tangible property tokens being associated with certain of said real property spaces to represent tangible property associated with such real property spaces, two or more movable player tokens, each said player token being dedicated to a different player, and movement means for determining the movement of said player tokens about said game board, whereby players are entitled to acquire property and earn income while moving their player tokens about said primary pathway by acquiring ownership of particular real property spaces and purchasing and selling tangible property tokens associated therewith, two or more claim boards, each said claim board being dedicated to a particular player and comprising a miniature representation of said game board, and a set of claim pegs of a number equal to the number of real property spaces on said primary pathway, each said claim peg being associated with a particular real property space and adapted to be placed upon a player's claim board upon acquisition of such real property space by such player to indicate that the property has been acquired.

4,360,206

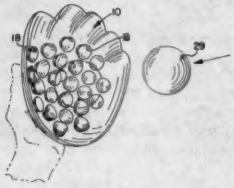
MITT AND TARGET FOR CATCHING A BALL

Donald J. Bian, 549 Spring Rd., Elmhurst, Ill. 60126

Filed Mar. 23, 1981, Ser. No. 246,686

Int. Cl.[3] A63B *63/00*

U.S. Cl. 273—344 8 Claims



1. A target and toy comprising a mitt adapted to catch a round, hollow ball having a smooth surface, the improvement comprising the combination of:

a dish member having a rim extending about the periphery thereof;

said dish member having a concave front and having a back;

said dish member having a plurality of openings therein;

suction cup means adapted to be located in the openings and thereby adapted to connect with said ball;

flexible strap with connecting means adapted to be removably attached to the back of said dish member for mounting said dish to a person's hand;

said flexible strap having attachment buttons located at each end;

said attachment buttons having collar means adapted to nest into said openings of the dish and also having a flexible washer portion adapted to fit through said openings and hold the strap in position.

4,360,207

HEATER FOR SLIDING SEAL STRUCTURE

Adelbert Rappange, Kleindöttinger; Robert Richard, Zürich, and Roland Stelzer, Würenlos, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Switzerland

Filed May 29, 1980, Ser. No. 154,380

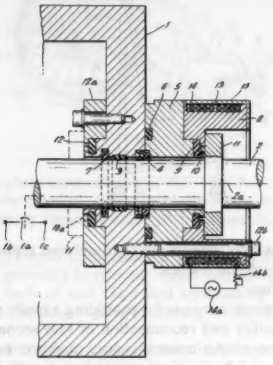
Claims priority, application Switzerland, May 31, 1979, 5072/79

Int. Cl.[3] F16S *15/34*

U.S. Cl. 277—22 5 Claims

1. A seal assembly for sealing the opening between the outer periphery of a movable shaft and an opening in the wall of a housing which permits entry of said movable shaft into the interior of said housing; said movable shaft having a longitudinal axis; said housing being filled with a fluid under positive pressure; said seal assembly including a pliable annular seal

which surrounds said shaft and slidably engages the outer surface of said shaft to permit relative movement between said pliable annular seal and said shaft; heat conductive ring means supporting said pliable annular seal and pressing said seal against said housing and fixing said seal against the interior of said opening in said housing; and electrically energizable heater means connected to said heat conductive ring at a location physically removed from said pliable annular seal and in thermal conduction relation with respect to said seal for heating said seal to maintain the sealing properties of said seal and to prevent said seal from leaking under low temperature conditions which would make said seal ineffective in the absence of the thermal energy applied to said seal by said heater means and second seal ring means disposed on said heat conductive ring means and concentric with said opening in said housing;



said second seal ring means being a static compressed seal; said second seal ring means being heated by heat produced by said heater means and conducted thereto by said heat conductive ring means to maintain the sealing properties of said second seal ring means and to prevent said second seal ring means from leaking under low temperature conditions; said annular seal and said second seal ring means being coaxial with one another and each being disposed in a common plane; said common plane being perpendicular to said longitudinal axis of said shaft; a third seal ring means disposed on said heat conductive ring means and concentric with said opening in said housing; said third seal means comprising a face seal adapted to receive a cooperating seal member secured to said shaft; said seal member secured to said shaft being adapted to engage said third seal means when said shaft is in a given end position.

4,360,208

SEGMENTED ANNULAR LIP SEAL

Alfred Hill, Abbots Langley, and Robert G. Baker, Woking, both of England, assignors to The Glacier Metal Company Limited, Middlesex, England

PCT No. PCT/GB79/00061, § 371 Date Dec. 17, 1979, § 102(e) Date Dec. 17, 1979, PCT Pub. No. WO79/00943, PCT Pub. Date Nov. 15, 1979

PCT Filed Apr. 17, 1979, Ser. No. 178,461

Claims priority, application United Kingdom, Apr. 18, 1978, 15223/78

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—153 **15 Claims**

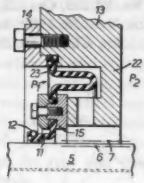
1. An annular seal between a rotatable shaft sleeve and a surrounding housing to prevent the flow of fluid along said shaft sleeve comprising:

a rigid ring movably disposed within said housing and surrounding said shaft sleeve such that said ring is movable relative to said shaft sleeve in a radial direction;

first and second flexible flanges attached to said ring such that said first flexible flange is disposed between and connected to said housing and said ring wherein said first flexible flange further comprises a portion spaced radially from said housing and said ring;

said second flexible flange being disposed between said ring and said shift sleeve and connected to said ring;

a sealing contact lip operatively associated with said second flexible flange and forming a seal against said shaft sleeve, wherein said second flexible flange is disposed between



said shaft sleeve and said ring and wherein said second flexible flange further comprises a portion spaced radially from said housing and said shaft sleeve and wherein said first and second flanges further comprise deformation means for variations of radial clearance between said housing and said shaft sleeve during rotation of said shaft sleeve such that said seal is maintained at said sealing contact lip.

4,360,209

UNIVERSAL JOINT DUST BOOT ASSEMBLY

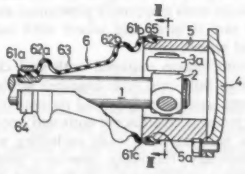
Mikio Ukai, Nagoya; Minoru Odagiri, Ichinomiya; Hidemi Sugiura, Takahama, and Yasunori Hatanaka, Toyota, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nagoya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 19, 1980, Ser. No. 179,565

Claims priority, application Japan, Mar. 11, 1980, 55-31369

Int. Cl.³ F16D *3/84*

U.S. Cl. 464—175 **6 Claims**



1. A universal joint sealing assembly comprised of two joint elements where at least one of said joint elements has a housing with an outer peripheral surface which includes a plurality of straight, curved and corner portions with the corner portiosn having a greater curvature than that of the other portions,

an annular covering dust boot made of resilient material having two axially aligned annular open end portions integrally formed therewith;

said two open end portions being closely mounted on said two joint elements, respectively;

a sealing strip for clamping said annular covering portion onto said joint elements;

wherein the opening of at least one of said open end portions to be mounted on said at least one of said joint elements is provided with a like plurality of straight, curved, and corner portions wherein the curvature of the corner portions of said dust boot is smaller than that of said corner portions of said at least one of said joint elements; and

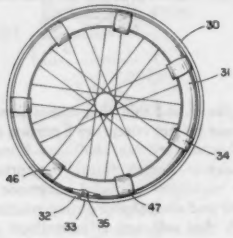
the other portions of said at least end opening being shaped so as to be similar to the corresponding portions of said at least one of said joint elements so that there is greater

tension at the corner portions between the housing and said dust boot.

4,360,210
WHEEL GLIDE

Helen L. Osting, 5313 C Tara Ct. North, Indianapolis, Ind. 46224

Division of Ser. No. 87,235, Oct. 22, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 211,254
Int. Cl.³ B62B *19/02*
U.S. Cl. 280—13 **1 Claim**



1. A snow ski removably attachable to a shopping cart wheel comprising:

a longitudinally flexible but laterally rigid strip of material with opposite ends and extendable peripherally around a wheel being initially provided in roll form and cut to length to fit said shopping cart wheel, said strip having a width of at least one and one-half times the width of said wheel to support same atop snow;

clamp means fixedly mounted on said strip and engageable with said wheel being operable to removably hold said strip peripherally on said wheel, said clamp means including a plurality of clamps fixedly attached to and atop said strip, each of said clamps has a pair of upwardly extending spaced apart arms with integrally connected proximal ends forming a portion coplanar with said strip and spring biased distal ends grippingly positioned around said wheel to hold said strip to said wheel with said strip rotating with said wheel; and

strip fastening means engaged with said clamp means and operable to hold said ends together while said strip is on said wheel, said strip fastening means including a pair of fastener strips with adjacent ends and opposite slotted end portions, said adjacent ends including a projection and complementary receiving aperture thereon releasably connecting said adjacent ends together, said strip fastening means further including a string configured element extending across said opposite ends of said strip to and around at least two of said clamps located closest to and on opposite sides of said opposite ends of said strip, said string having opposite free ends extendable through said slotted end portions forcing said two clamps closer together.

4,360,211
DOLLY APPARATUS

Richard E. Blake, Indianapolis, Ind., assignor to Perry Manufacturing, Inc., Indianapolis, Ind.

Filed Sep. 2, 1980, Ser. No. 183,245
Int. Cl.³ B62B *3/02*
U.S. Cl. 280—79.3 **10 Claims**

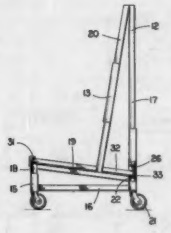
1. A knock-down dolly apparatus which comprises:

first and second end frames, each of said end frames including an upwardly and rearwardly-slanted rear support member, a downwardly and rearwardly-slanted bottom support member, a generally horizontal base support member, a generally vertical rear support brace connected with the rear support member and the base support member, and a bottom support brace connected with the bottom support member and the base support member, the bottom support member also being connected with one of the rear support brace and the base support member, the rear support member also being connected with one of the bottom support member and the base support member;

wheel means connected with each of said end frames for permitting rolling of said end frames along a support surface;

a first truss;

first connection means for providing a ready connection, disconnection and reconnection of said first truss between



one of the rear support member and rear support brace of each of said end frames;

a second truss;

second connection means for providing a ready connection, disconnection and reconnection of said second truss between one of the bottom suport member, base support member, and bottom support brace of each of said end frames;

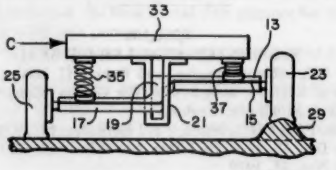
a platform received adjacent the bottom support members and being rearwardly-slanted; and

retaining means for retaining said platform adjacent the bottom support member.

4,360,212
OFFSET VEHICLE AXLE

Gilbert Scigalski, 7312 W. 80th St., Bridgeview, Ill. 60455

Filed Oct. 22, 1980, Ser. No. 199,652
Int. Cl.³ B60G *9/00*
U.S. Cl. 280—111 **14 Claims**



1. In a vehicle having a body and wheels for rolling over a surface, the improvement of an offset axle, comprising:

shaft means for connecting at least two wheels and for pivoting when the wheels roll over irregularities of said surface, said shaft means including parallel and offset first and second end portions and a center portion for connecting the end portions; and

support means for blocking lateral movement of said shaft means with respect to said body and for allowing said shaft means to pivot and move vertically with respect to the body so that the wheels are independently deflected in respective vertical planes when they roll over irregularities of said surface.

4,360,213

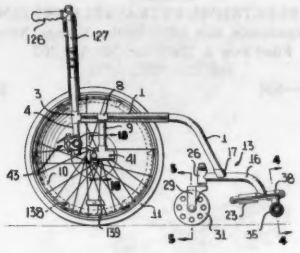
SPORT TYPE WHEEL CHAIR

Lawrence A. Rudwick, 3200 Glenwood Pl., Falls Church, Va. 22041, and Steven A. Schuman, 6038 Westchester Park Dr., College Park, Md. 20740

Filed Apr. 1, 1980, Ser. No. 136,576

Int. Cl.³ A61G 5/02

U.S. Cl. 280—242 WC **14 Claims**



1. A wheel chair comprising:

two generally parallel, elongated main frame members extending along opposite sides of the chair from front to back,

said members each comprising a continuous hollow tube having a generally horizontal region extending from adjacent the back of said chair and terminating in a downwardly depending region extending to the front of said chair,

means permitting flexure of said main frame members under front end impact and torque loads,

said means comprising the length and wall thickness of said hollow main frame members and the properties of the material thereof.

means for securing main wheels each to a different one of said main frame members adjacent the back to the wheel chair,

means for securing small front wheels each to a different one of said main frame members adjacent the front of the wheel chair, and

means for detachably connecting the main frame members one to the other.

4,360,214

SHOCK ABSORBING DEVICE FOR REAR WHEEL OF MOTORCYCLE

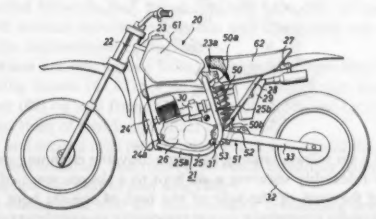
Tokio Isono, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1980, Ser. No. 192,638

Claims priority, application Japan, Oct. 4, 1979, 54-137548[U]

Int. Cl.³ B62K 25/26

U.S. Cl. 280—284 **14 Claims**



1. A shock absorbing device for a rear wheel of a motorcycle comprising a rear wheel support frame having a front end vertically swingably connected to a body frame, said rear wheel support frame rotatably supporting said rear wheel, a rotary member vertically rotatably connected to said rear wheel support frame, a shock absorber having an upper end pivotally connected to said body frame and a lower end connected to said rotary member, and a rod member connecting said rotary member to said body frame, wherein said rotary member is located ahead of a central part of said rear wheel support frame in the longitudinal direction of said motorcycle, said lower end of said shock absorber is pivotally connected to a front part of an upper portion of said rotary member in the longitudinal direction of said motorcycle, said rotary member is pivotally connected to said rear wheel support frame at a rear part of said upper portion thereof, and said rod member is pivotally connected at the front end thereof to a lower portion of said body frame and at the rear end thereof to a lower portion of said rotary member.

4,360,215

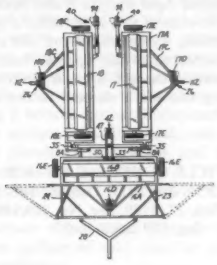
DRILL HITCH TRANSPORT

Arthur H. Nohl; DeWayne A. Nohl, and Alvin L. Nohl, Jr., all of 384 8th St., Hancock, Minn. 56244

Filed May 7, 1981, Ser. No. 261,502

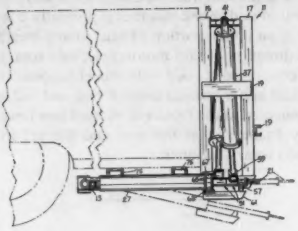
Int. Cl.³ A01B 73/00

U.S. Cl. 280—413 **13 Claims**



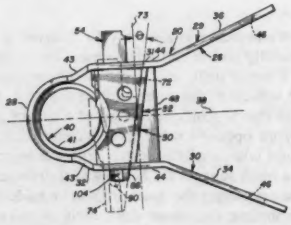
2. In a drill hitch and transport assembly for utilizing at least three drills in generally end to end arrangement for seeding a wider path than a single drill, said drills each comprising a frame having end wheels at the outer ends of the drill, there being a center drill that is positioned ahead of a pair of outer drills extending from opposite sides of said center drill and overlapping the end wheels of the center drill, the improvement comprising a hitch support for holding said drills in end to end relation and permitting the outer drills to be folded to a transport position trailing the center drill, each of said drills having a forwardly directed hitch pole, tow bar means mounted with respect to said center drill and extending laterally outwardly from opposite sides thereof, means to connect the hitch poles of each of the outer drills to one of said tow bar means, respectively, a first frame attached to and positioned rearwardly of the center drill, means to pivotally mount the inner ends of the outer drills to said first frame about at least an upright axis whereby said outer drills may pivot about the upright axis to a transport position with the outer drills generally parallel to each other and parallel to the direction of travel, hitch wheel means for supporting the hitch poles of the outer drills when the outer drills are folded to transport position, first wheel means at the outer ends of each of the outer drills operable to lift and support the outer ends of said outer drills for transport, and adjustment means for moving said first wheel means to a position wherein they clear the ground during use of the drills.

4,360,216
UNIVERSALLY-POSITIONABLE BILATERALLY-SYMMETRICAL THREE-CYLINDER-OPERATED HITCH
George H. Wiemers, Rte. 1, Greenview, Ill. 62642
Filed Dec. 5, 1980, Ser. No. 213,746
Int. Cl.[3] B60D *1/00*
U.S. Cl. 280—479 R 4 Claims



1. A universally-positionable bilaterally-symmetrical hitch, comprising: a horizontally disposed rigid U-shaped base frame open at its rear end; a horizontally disposed double-acting hydraulic cylinder endwise universally coupled medially to the bight portion of said frame and having its piston rod extendable beyond the open end of said base frame; a downwardly open generally omegashaped rigid upright frame bridging and rigidly connected to the ends of said base frame; a pair of upright double-acting hydraulic cylinders having the closed end of each universally connected to said upright frame adjacent an end of the bight portion thereof; a hitch element; and means universally coupling said hitch element to the outer ends of each piston rod.

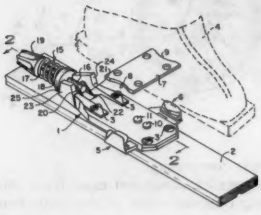
4,360,217
VEHICLE COUPLING DEVICE
Jerry W. Pittman, P.O. Box 2111, Denton, Tex. 76201
Filed Sep. 22, 1980, Ser. No. 189,138
Int. Cl.[3] B60D *1/06*
U.S. Cl. 280—513 16 Claims



1. A coupling device for use on a towed vehicle, comprising: a strap-like body having a U-shaped front portion for receiving a ball of a ball-type hitch, and a side portion extending from each end of the U-shaped portion adapted to be connected to the towed vehicle; and a latch assembly for locking the ball in said body having a bracket connected to each side portion of said body, and a locking element supported by the bracket for movement between opened and closed positions, the movement being in a direction generally transverse to a lateral line which bisects the U-shaped portion, said locking element having a body with a bearing surface to engage the ball when in the closed position and with a surface moveably cooperating with a surface on said bracket, the cooperating surfaces being disposed at an angle relative to a line extending transversely to the lateral line, the angle being sufficient to allow the bearing surface to move away from the ball when the coupling device is in a negative load condition while being less than that angle which causes the locking element to move toward the opened position when the ball re-engages the locking element from the negative load condition.

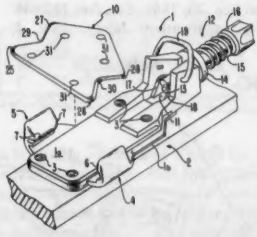
14. A coupling device as set forth in claim 1, including spring means connected to an end of the locking element for preventing accidental movement of the locking element to the opened position after being moved to the closed position.

4,360,218
STEP-IN ELECTRICAL RELEASABLE SKI BINDING
Richard G. Spademan, Box 6410, Incline Village, Nev. 89450
Filed Jun. 2, 1980, Ser. No. 155,302
Int. Cl.[3] A63C *9/08*
U.S. Cl. 280—624 23 Claims



10. An electrical releasable step-in ski binding comprising:
- securing means movable from a non-securing condition to a securing condition for releasably securing a ski boot to a ski;
- a force unit for applying a securing force to the securing means;
- means for holding the securing means in the non-securing condition against the securing force; and
- electrical means responsive to placing of the ski boot in skiing position relative to the securing means for releasing the securing means from the holding means.

4,360,219
SKI RELEASE BINDING WITH REARWARDLY MOVABLE CLAMPING MEMBER
Richard G. Spademan, P.O. Box 6410, Incline Village, Nev. 89450
Continuation of Ser. No. 890,574, Mar. 20, 1978. This application Aug. 7, 1980, Ser. No. 176,012
Int. Cl.[3] A63C *9/08*
U.S. Cl. 280—624 12 Claims



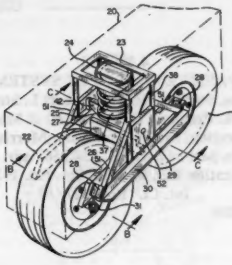
1. In a ski release binding having a movable clamping member for releasably securing a ski boot to a ski rearward of the toe and forward of the rear of the heel of the ski boot, the improvement comprising means responsive to a predetermined lateral movement of said movable clamping member relative to said ski for allowing said movable clamping member to move rearwardly out of the way of lateral movement of said ski boot relative to said ski.

4,360,220

INDEPENDENT, LOAD-SEEKING, PRELOADED, VEHICLE SUSPENSION

Lionel W. Beers, 16730 NE. Hassalo St., Portland, Oreg. 97230

Filed Jul. 14, 1980, Ser. No. 167,829
Int. Cl.³ B60G 5/02
U.S. Cl. 280—677 10 Claims



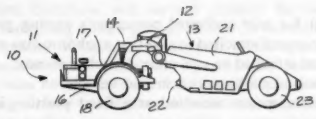
1. A self-contained tandem two wheel suspension unit for a vehicle comprising a pair of walking beams on opposite sides of said wheels, a pair of axles for said wheels on the opposite ends of said walking beams, a trunion shaft interconnecting central portions of said walking beams between said wheels, a frame for mounting said unit on a vehicle, a spring support for said frame on said trunion shaft, and stop means on opposite end portions of said walking beams engaging said frame to hold said spring support in preloaded condition.

4,360,221

TORSION BAR AXLE SUSPENSION

Ernest W. Wagner, Cottonwood, Ariz., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01440, § 371 Date Oct. 27, 1980, § 102(e) Date Oct. 27, 1980, PCT Pub. No. WO82/01518, PCT Pub. Date May 13, 1982
PCT Filed Oct. 27, 1980, Ser. No. 273,887
Int. Cl.³ B60G 19/00
U.S. Cl. 280—689 10 Claims



1. In a suspension system for a vehicle (10) having a frame (16), an axle (25) transverse to the longitudinal centerline of said frame (16) and a pair of shock-absorbing members (31,32) connected between said frame (16) and axle (25) to enable relative vertical movement between said frame (16) and axle (25), the improvement comprising:

a torsion bar (40) spaced from and parallel to said axle (25);

bearing means (41,42) for rotatably mounting said torsion bar (40) on said frame (25) outwardly from and on opposite sides of said longitudinal centerline;

first and second rods (46,47) one on each side of said longitudinal centerline, said rods (46,47) each extending from said torsion bar (40) to said axle (25);

first means (53*a*,53*b*) for non-rotatably connecting both of said rods (46,47) to said torsion bar (40);

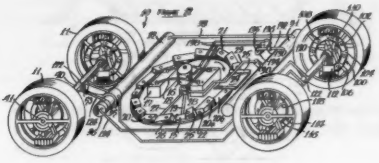
second means (58*a*,58*b*) for connecting both of said rods (46,47) to said axle (25).

4,360,222

VEHICLE WITH PNEUMATIC ASSEMBLY FOR DRIVING, BRAKING, AND REDUCING FRICTION ON BEARINGS

William M. Fisher, 2017 Plainfield, Des Plaines, Ill. 60018

Filed Jul. 7, 1980, Ser. No. 166,472
Int. Cl.³ B60G 25/00
U.S. Cl. 280—711 10 Claims



1. Apparatus for reducing the effective weight supported by the cylindrical roller bearings associated with each of the wheels of a vehicle having a frame, thereby to reduce the friction in said bearings when the vehicle is moving,

each of said bearings having an inner race, an outer race, and a plurality of rollers positioned between said inner race and said outer race,

an axle received in and secured to said inner race of said bearings,

said inner race of said bearings is operably connected to said vehicle frame,

each of said vehicle wheels being rotatable and being secured to said outer race, each wheel defining a generally cylindrical inside surface, and a generally cylindrical outer surface adapted to engage a supporting surface,

air chamber means supported by said vehicle frame means and operably connected to said inner race of said bearings and having a bottom surface juxtaposed to a portion of said inside surface of said wheel, said bottom surface defining a plurality of apertures and being positioned generally below said bearings,

means for supplying air to said air chamber means when said vehicle is moving,

said inside surface of said wheel being in engagement with said bottom surface of said chamber means when said vehicle is stationary,

said inside surface of said wheel being movable to a position spaced from said bottom surface of said air chamber and means when said vehicle is moving,

whereby air supplied to said air chamber means when said vehicle is moving exits through said apertures and is directed against said inside surface of said wheel, thereby forming an air pocket between said inside surface of said wheel and said bottom surface of said air chamber means, and providing a lift effect on the air chamber means and correspondingly on said vehicle frame and said inner race of said bearings, thereby reducing the effective vehicle weight that is supported by the bearings to reduce the friction in said bearings when the vehicle is moving.

4,360,223

LOW MOUNT, EASILY ASSEMBLED, AIR BAG PASSIVE RESTRAINT MODULE

George F. Kirchoff, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Filed Mar. 26, 1981, Ser. No. 247,705
Int. Cl.³ B60R 21/10
U.S. Cl. 280—729 15 Claims

1. An air bag module for an automotive vehicle comprising,

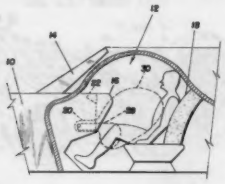
a housing having a closed end and an open end,

a flange on the open end of said housing,

foldable first bag means normally folded in said housing adjacent the closed end and having first and second openings to the interior thereof, the first of the openings being

adapted for connection to a source of gas for the inflation of said first bag means,

pressure responsive orifice means associated with the second opening of said first bag means for controlling gas flow outwardly of said first bag means through the second opening, and,



foldable second bag means normally folded in said housing between the open end thereof and said first bag means, said second bag means having an opening that is attached in gas sealing relation to said flange.

4,360,224

TRICYCLE WITH TWO FORE WHEELS

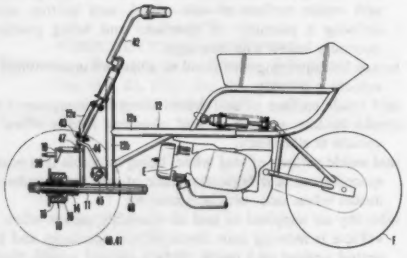
Toshiyuki Sato, and Nobuyuki Kanno, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 54,868, Jul. 5, 1979, abandoned, which is a continuation of Ser. No. 825,723, Aug. 18, 1977, abandoned. This application Nov. 21, 1980, Ser. No. 209,026

Claims priority, application Japan, Aug. 24, 1976, 51-100227

Int. Cl.³ B62D *61/06*

U.S. Cl. 280—772 **8 Claims**



1. A tricycle comprising:

a main frame;

a torsion bar extending longitudinally at the forward portion of said main frame, one end of said torsion bar being connected to said main frame;

a neidhart cushion means having a longitudinally-extending axis of rotation, rotatably mounted on said main frame, said neidhart cushion means including an inner cylinder, an outer cylinder and resilient means positioned between said inner and outer cylinders for limiting relative rotation therebetween, one of said cylinders being connected to the other end of said torsion bar;

a lower lefthand arm having an inner end connected to one of said cylinders;

a lower righthand arm having an inner end connected to the other of said cylinders;

a righthand link having a lower end pivotally connected to the outer end of said lower righthand arm;

a lefthand link having a lower end pivotally connected to the outer end of said lower lefthand arm;

an upper lefthand arm having an outer end pivotally connected to the upper end of said lefthand link;

an upper righthand arm having an outer end pivotally connected to the upper end of said righthand link;

inner ends of said upper arms being pivotally connected to said main frame; and

means for supporting a front wheel on each of said links, respectively.

4,360,225

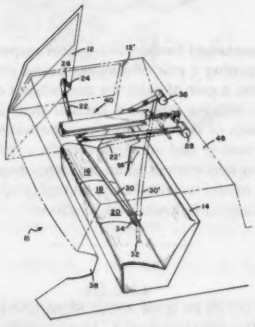
PASSIVE SEAT BELT SYSTEM

Rudy V. Thomas, Sterling Heights; Robert L. Stephenson, Utica, and Richard L. Frantom, Richmond, all of Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 138,956, Apr. 10, 1980. This application Oct. 3, 1980, Ser. No. 193,685

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **22 Claims**



11. A passive seat belt system for a vehicle having center and outboard passenger seating positions, a door adjacent said outboard passenger's seating position and a roof, said system comprising:

first anchor means mounted outboard of said outboard passenger's seating position;

second anchor means mounted at a fixed position in said vehicle;

a seat belt for said outboard passenger's seating position having one end attached to said first anchor means and the other end attached to said second anchor means;

third anchor means provided in said vehicle;

fourth anchor means mounted at a fixed position in said vehicle;

a seat belt for said center passenger's seating position having one end attached to said third anchor means, said third anchor means being located at a position such that said seat belt for said center passenger's seating position is adapted to extend across said seating position from the inboard side thereof, the other end of the belt being attached to said fourth anchor means; and

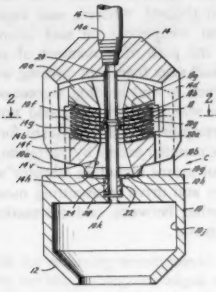
a grooved shaft rotatably mounted to said roof of said vehicle at a position adjacent to said center and outboard passengers' seating positions,

movable means movable along the grooves of said shaft, each of said belts being capable of contact with said movable means, said movable means being movable to a first position in said vehicle whereby said belts are in non-restraining positions to facilitate access to said center and outboard passenger's seating positions and said movable means being movable to a second position in said vehicle whereby said belts are in restraining positions to provide seat belt restraint for said seating positions.

4,360,226
ROLL-FLEX CONNECTOR

James A. Burton, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Sep. 5, 1980, Ser. No. 184,360
Int. Cl.³ F16L 27/00
U.S. Cl. 285—223 21 Claims



1. A connector for joining members in large force load transfer contact while enabling limited relative angular movement between the load carrying connected members by controlling the movement of engaged load carrying surfaces to prevent damage thereto from connector movement, comprising:

a first member forming a longitudinal axis and having a load carrying surface of substantially spherical configuration, said first member having means for connecting with a first structural assembly;

a second member forming a longitudinal axis and having a load carrying surface of substantially spherical configuration, said carrying surface of said second member disposed for facing said load carrying surface of said first member to prevent separation of said first member and said second member in response to force loading of said first and second members in a first direction along said longitudinal axes, said second member engageable with said first member to prevent separation in response to a force loading in a direction along said longitudinal axes opposite to the first direction, said second member having means for connecting with a second structural assembly; and

a plurality of stacked roll support plates operably disposed between said load carrying surfaces, each of said roll plates having an outer substantially spherical load carrying surface and an inner substantially spherical load carrying surface formed by a radius greater than the forming radius of said outer spherical load carrying surface, said inner surface supporting the outer surface of said adjacent plate while enabling said outer surface to roll on said inner surface of said adjacent plate to compensate for angular movement of said first member relative to said second member without sliding movement between said plurality of plates while transmitting the force load between said first and second members.

4,360,227
PIPE COUPLING WITH IMPROVED GASKET

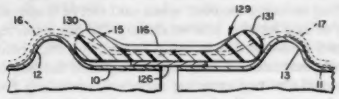
Donald Y. Bridges, 3014 Creek Ct., Roswell, Ga. 30075

Continuation-in-part of Ser. No. 117,665, Feb. 1, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,279
Int. Cl.³ F16L 21/06
U.S. Cl. 285—373 12 Claims

1. A gasket for forming a seal between two adjacent pipe ends and a coupling spanning the two pipe ends, comprising:

a pair of spaced apart O-rings joined along a portion of their respective annular bodies by a connecting member;

said connecting member comprising a web of flexible material defining parallel sides, each of said sides being bonded along its length to one of said O-rings, a pair of elevated cross ridges extending between said O-rings at opposite

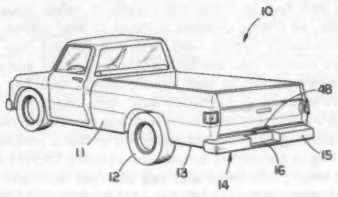


ends of said connecting member, and a depressed central portion bounded by said O-rings and said elevated cross ridges.

4,360,228
BUMPER APPARATUS

Eldon S. Rasmussen, 6035 S. Flynn Rd., Indianapolis, Ind. 46241, and John P. VanderMaas, 16728 State Rd. 4, Goshen, Ind. 46526

Filed Nov. 28, 1980, Ser. No. 211,239
Int. Cl.³ B60R 19/04
U.S. Cl. 293—118 9 Claims



1. A bumper apparatus for mounting a bumper to the rear of the frame of a truck or similar vehicle which comprises:

a bumper;

mounting means for mounting said bumper to the vehicle frame to have said bumper pivotable about a horizontal axis transverse of the vehicle frame to have a first, up position and a second, down position;

locking means for locking said bumper to the vehicle frame in the up position, said locking means including a first arm member and a second arm member, each of said arm members being mounted to one of said mounting means and said bumper to have each of said arm members be pivotable about a vertical axis when said bumper is in the up position, said locking means further including a first locking member attached to the first arm member and a second locking member attached to the second arm member, each of the first and second locking members being operable upon pivoting of the respective arm member to connect with the vehicle frame and lock the bumper in the up position.

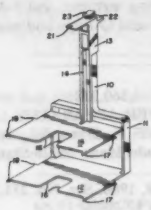
4,360,229
REFUSE COLLECTION DEVICE

Frank N. Kinney, 300 Fountain Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 946,540, Sep. 28, 1978, Pat. No. 4,231,602. This application Aug. 25, 1980, Ser. No. 181,126
Int. Cl.³ A01K 29/00
U.S. Cl. 294—1 BA 3 Claims

1. A refuse collection device comprising an elongated vertical handle, a vertically disposed rectangular frame on the lower end of said handle, a first horizontally disposed flat rectangular bag entering member on the lower portion of said rectangular frame extending outwardly therefrom, a sleeve movably mounted on said handle above said rectangular frame, a depending arm on said sleeve arranged in parallel relation to

said handle, a secondary horizontally disposed flat rectangular bag entering member on the lower end of said arm extending outwardly therefrom, said secondary flat bag entering member arranged for vertical movement toward and away from said first flat bag entering member when said sleeve is moved longitudinally of said handle, said secondary flat bag entering member on said sleeve and arm being vertically offset below said sleeve and positioned directly above said first flat bag entering member, said flat bag entering members extending from said frame and arm respectively at right angles thereto and adapted to enter an open ended bag positioned thereover and hold and



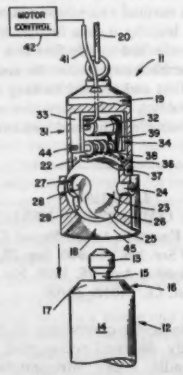
tension said bag in open end condition when moved apart vertically, an elastic element secured to said sleeve and said handle normally urging said first and second bag entering members toward one another whereby manual movement of said sleeve relative to said handle moves said bag entering members apart so as to expand said open ended bag and hold the same on said first and secondary bag entering members and permit said bag to be turned inside out so that a peripheral area of said bag is positioned around the opening thereof in folded relation over portions of said bag entering members and said elastic element urges the bag entering members and the folded bag together when said sleeve and handle are released.

4,360,230

SELF LOCKING COUPLING MECHANISM FOR ENGAGING AND MOVING A LOAD

Richard L. Wood, Livermore; Alan B. Casamajor, Pleasanton, and Richard E. Parsons, Orinda, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 12, 1980, Ser. No. 186,886
Int. Cl.³ B66C *1/66*
U.S. Cl. 294—86 A **18 Claims**



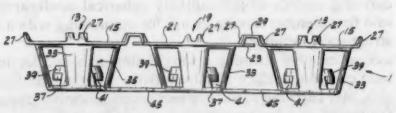
1. Coupling mechanism for engaging a knob that is secured to a load through a neck of smaller diameter than the knob, the mechanism having a connector member and a turnable member journaled to said connector member for turning between a load receiving and releasing first orientation and a load holding second orientation, the turnable member having an opening for receiving said knob and having a slot of lesser width than said knob into which said neck is received as said turnable member is turned to said load holding second orientation, the coupling mechanism including locking means for preventing release of said knob when said turnable memer is at said load holding second orientation thereof, wherein said locking means includes a structural component on said connector member situated adjacent the path of movement of said opening in position to block said neck from said opening when said turnable member is turned to said holding second orientation, and control means for selectively turning said turnable member between said orientations thereof and means for resisting turning of said turnable member except by operation of said control means, said control means including a motor secured to said connector member and drive transmitting means for turning said turnable member between said orientations thereof by operation of said motor.

4,360,231

BOTTLE CARRIER

James A. Bolin, Sapulpa, Okla., assignor to Liberty Glass Company, Sapulpa, Okla.

Filed Nov. 3, 1980, Ser. No. 203,054
Int. Cl.³ B65D *71/00*
U.S. Cl. 294—87.2 **19 Claims**



1. A carrier for bottles, each of which has a neck and a finish at the bottle mouth, adapted for carrying a plurality of bottles grouped in a predetermined array by the bottle necks with the bottles hanging down from the carrier, and enabling relatively stable stacking of bottles, said carrier comprising:

a plurality of bottle seats each adapted for the seating therein of the bottom of a bottle held by a carrier thereabove, each seat having a central opening;

means for spacing the plurality of bottle seats in correspondence with said predetermined array;

bottle gripper supporting means beneath each seat, each supporting means comprising a set of supporting members extending down from the respective seat spaced around the seat, being centered with respect to the seat, and inclined inwardly toward one another; and

a plurality of bottle gripper means, one for each seat, each comprising a ring at the lower end of the respective set of supporting members and resilient means on the ring adapted to be spread apart by the upper end of a bottle entered upwardly through the ring and adapted releasably to grip the neck of the bottle at the lower end of the finish for hanging of the bottle by the finish;

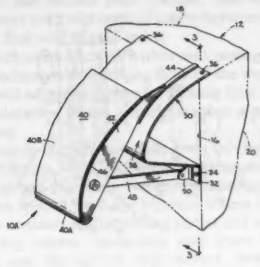
said supporting members and said resilient means being so dimensioned relative to the bottle finish that the mouth of a bottle carried by any of said resilient means will not project above the respective seat;

whereby when a set of bottles gripped by a carrier is stacked upon another set of bottles gripped by a carrier, the bottles gripped by the upper carrier may be maintained substantially in vertical alignment with the bottles gripped by the lower carrier by seating of the bottles gripped by the upper carrier in the seats of the lower carrier, to provide stability for the stack of bottles.

4,360,232
AERODYNAMIC DRAG REDUCTION APPARATUS FOR VEHICLES OR THE LIKE

Donald L. Elder, 18557 Vessing Rd., Saratoga, Calif. 95070

Filed Nov. 5, 1979, Ser. No. 90,298
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S 7 Claims



1. Apparatus for reducing aerodynamic drag on bluff vehicles or the like having rectangular edges, which comprises

a curved inner fairing extending forwardly from the bluff surface of the vehicle and substantially merging with the rectangularly-related, rearwardly extending surface thereof, and

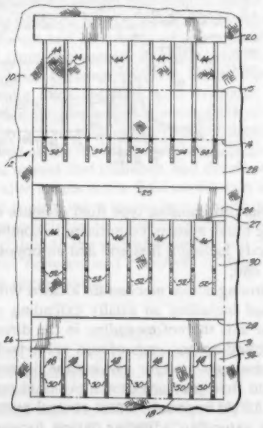
an air foil member supported in spaced relation forwardly of said fairing in the direction of vehicle travel to provide a rearwardly convergent air flow channel between said fairing and said air foil member,

said air foil member having a major curvature radius at least one-eighth of the transverse dimension of the bluff surface of the vehicle.

4,360,233
METHOD OF BULKING AN IN SITU OIL SHALE RETORT SUBSTANTIALLY FULL OF FRAGMENTED SHALE

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 79,874, Sep. 28, 1979, abandoned. This application Oct. 30, 1980, Ser. No. 202,072
Int. Cl.³ E21C *41/10*
U.S. Cl. 299—2 35 Claims



1. A method of recovering gaseous and liquid products from an in situ oil shale retort in a retort site within a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, such an in situ retort having a top boundary, generally vertically extending side boundaries, and a bottom boundary of unfragmented formation, the method comprising the steps of:

excavating an upper level base of operation at an elevation above the elevation of the top boundary, the upper level base of operation having a sufficient horizontal cross-section for providing effective access over substantially the entire horizontal cross-section of the fragmented mass being formed;

excavating formation to form at least one substantially horizontal void in the subterranean formation, such a subterranean formation having an upper zone of unfragmented formation above such a void and a lower zone of unfragmented formation below such a void;

explosively expanding unfragmented formation from at least one of the zones of unfragmented formation toward such a void, thereby forming a principal portion of the fragmented permeable mass of formation particles and

leaving a void space between the upper surface of such a principal portion of the fragmented permeable mass and the bottom surface of remaining unfragmented formation overlying such a void space;

thereafter explosively expanding a bottom portion of remaining unfragmented formation overlying such a void space, downwardly toward the void space, for forming a minor portion of the fragmented permeable mass of formation particles and leaving a sill pillar of unfragmented formation between the top boundary and the upper level base of operation for providing a barrier between the upper level base of operation and the retort during retorting operations;

introducing oxygen supplying gas into the in situ oil shale retort for establishing a combustion zone and a retorting zone in the fragmented permeable mass, wherein oil shale is retorted to produce liquid and gaseous products in the retorting zone, and for advancing the combustion zone and retorting zone through the fragmented mass; and

withdrawing liquid and gaseous products from the retort.

4,360,234
IN-SITU METHOD AND APPARATUS FOR SPARGING GAS BUBBLES

Limin Hsueh, Bedford; Robert A. Hard, Still River; Donald H. Davidson, Bedford, and Ray V. Huff, Acton, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,549
Int. Cl.³ E21B *43/28;* 299 *4/5*
U.S. Cl. 299—5 9 Claims

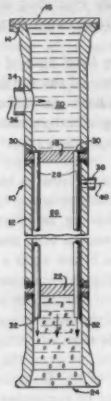
1. A gas sparging unit for use in introducing finely divided gas bubbles into a lixiviant used for in-situ mining of minerals, said device comprising:

a hollow casing having a first chamber formed therein into which liquid lixiviant is supplied, a second chamber isolated from said first chamber and an outlet end;

a plurality of porous tubes formed of sintered powdered metal extending into said second chamber with said tubes having one end in fluid communication with said first chamber, said first chamber being isolated from said outlet end and with the down stream ends of said tubes being positioned so that lixiviant containing gas bubbles can pass through said outlet end;

means for introducing a pressurized gas about the portion of said tubes in said second chamber to enable the gas to penetrate into said tubes so that the gas can be wiped from the interior of the tubes by the lixiviant flowing through the tubes to form a lixiviant containing finely divided bubbles; and

means for removing gas bubbles trapped upstream of said outlet, said means comprising a conduit for providing



communication between the interior of said casing adjacent the outlet end and the exterior of said casing.

4,360,235

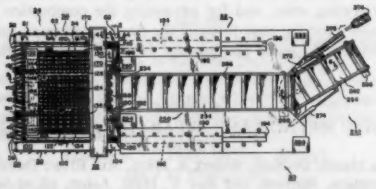
CUTTING AND CHISELING ASSEMBLY FOR MINING MACHINE AND METHOD PERFORMED THEREBY

Charles F. Mendola, South Bend, Ind., assignor to John J. Simala, South Bend, Ind., a part interest

Division of Ser. No. 106,679, Dec. 26, 1979, Pat. No. 4,298,232. This application Apr. 6, 1981, Ser. No. 251,383

Int. Cl.³ E21C *27/12*

U.S. Cl. 299—18 **18 Claims**



16. A method for extracting ore from a deposit of ore adjacent a previous extraction, comprising cutting into the deposit to form an undercut, cutting a vertical relief cut in the deposit in spaced relation to the previous extraction and upwardly from the undercut, forcing a chisel means into the deposit between the relief cut and the area of the previous extraction to dislodge ore from the deposit, and progressively raising the cutting and chiseling operations in coordinated steps until the desired height of vertical extraction of ore has been attained.

4,360,236

DOUBLE FIBRE MAGAZINE FOR BRUSH MANUFACTURING MACHINES

Boucherie Leonel P., Roeselare-Rumbeke, Belgium, assignor to Firma G.B. Boucherie, Naamloze Vennootschap, Izegem, Belgium

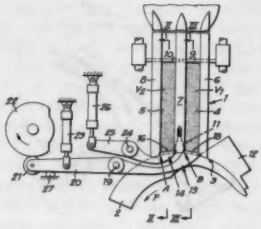
Filed Mar. 24, 1980, Ser. No. 132,844

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911668

Int. Cl.³ A46D *1/08*

U.S. Cl. 300—9 **3 Claims**

1. A brush stuffing machine including a stationary container with first and second compartments each having a discharge opening and containing stuffing material, a picker provided with a stuffing opening therein movable below said compartment discharge openings, each of said first and second compartments having means therein to push the stuffing material therein towards the corresponding discharge opening, a lifting device for each compartment adapted to raise said stuffing material when said picker stuffing opening is moving below the



other compartment and is being filled with material from said other compartment, means to alternately operate said lifting devices, and first and second stripper devices adjacent said first and second compartments respectively and each adapted to strip stuffing material from said stuffing opening after it has been filled from said first and second compartment, respectively.

4,360,237

DECELERATION SENSING TYPE FLUID PRESSURE CONTROL DEVICE FOR VEHICLE BRAKE SYSTEM

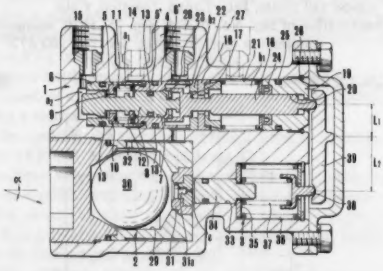
Toshifumi Maehara, Hanazono, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1980, Ser. No. 207,777

Claims priority, application Japan, Nov. 22, 1979, 54-151553; Mar. 6, 1980, 55-28439; Jun. 3, 1980, 55-74736

Int. Cl.³ B60T *8/14*

U.S. Cl. 303—6 C **5 Claims**



1. A deceleration sensing type fluid pressure control device for a vehicle brake system, comprising in combination:

a valve body having a first end and an oppositely disposed second end;

a proportioning action mechanism located within said valve body and including an axially extending control piston with the axis thereof extending in the direction between the first and second ends of said valve body, said action mechanism arranged for varying the degree of reduction of output fluid pressure from input fluid pressure in relation to a load imposed on said control piston;

an axially extending adjusting piston located within said valve body with the axis thereof extending in the direction between the first and second ends of said valve body and spaced laterally from the axis of said control piston;

passage means interconnecting the input fluid pressure of said action mechanism with one end of said adjusting piston;

a swaying lever located at the first end of said valve body and extending transversely of the axis of said control piston and adjusting piston, said lever having a first end and a second end and a stationary fulcrum spaced between said first and second ends thereof, said lever being in engagement with said control piston between said fulcrum and said first end of said lever;

a valve mechanism located within said passage means, said valve mechanism controlling flow of the input fluid pressure to said adjusting piston for closing flow thereto when the deceleration of the vehicle reaches a predetermined value; and

spring means in contact with said lever on the opposite side of said fulcrum from said control piston and including a control spring extending between said adjusting piston at a location spaced from the location where the input fluid pressure contacts said adjusting piston and said lever with said spring means contacting said lever between said fulcrum and the second end thereof, and said control spring arranged to impose said load on said control piston via said lever.

4,360,238

CONTROL VALVE ASSEMBLY

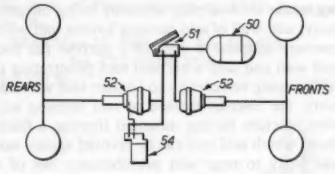
Glyn P. R. Farr, Birmingham, England, assignor to Girling Limited, Birmingham, England

Division of Ser. No. 963,159, Nov. 23, 1978, Pat. No. 4,245,868. This application Apr. 30, 1980, Ser. No. 145,352

Claims priority, application United Kingdom, Nov. 25, 1977, 49051/77

Int. Cl.³ B60T *8/16*

U.S. Cl. 303—24 A **6 Claims**



1. A vehicle braking system including at least one pressure actuator having opposed first and second chambers and a fluid connection between said chambers, a diaphragm separating the first chamber from the second chamber and movable by a pressure differential between said first and second chambers, means connecting the diaphragm to a hydraulic actuator so that movement of the diaphragm operates the hydraulic actuator to pressurize a hydraulic brake circuit connected thereto, driver controlled means for selectively supplying a pressurized operating fluid to said first chamber, and deceleration responsive control valve means in the fluid connection between said chambers; said control valve means being automatically operable in response to vehicle deceleration to control during braking the flow of fluid to the second chamber and thus the pressure differential between said chambers in dependence upon sensed vehicle deceleration.

4,360,239

MANUAL/AUTO BRAKE VALVE

Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jan. 21, 1980, Ser. No. 113,715

Int. Cl.³ B60T *11/12*

U.S. Cl. 303—117 **11 Claims**

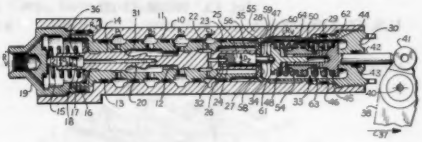
1. A manual/automatic brake modulating valve for an aircraft braking system having a hydraulic pressure source and a means for providing at least one servo command pressure responsive to an aircraft deceleration rate control signal, comprising:

a housing having a bore, an input port connected to said hydraulic pressure source, at least one servo command port connected to said aircraft deceleration rate control signal and an output port connected to said aircraft braking system;

a metering spool slideably contained in said bore in said housing and responsive to said aircraft deceleration rate control signal;

a means for manual actuation of said metering spool;

a means for generating a feel force during manual actuation of said valve; and



at least one servo piston and cylinder arranged to act between said metering spool and said means for generating a feel force having a stroke at least as great as the stroke of said metering spool, oriented with said cylinder reacting against said metering spool and said piston reacting against said means for generating a feel force so that said feel force and said displacement of said means for manual actuation of said metering spool are essentially independent of spool displacement as a result of said servo pressure while said feel force is directly responsive to displacement of said means for manual actuation of said metering spool, whereby said output may be responsive exclusively to said servo command pressure or responsive exclusively to said manual actuation.

4,360,240

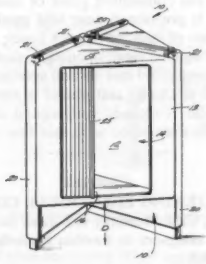
MODULAR STORAGE UNITS

Joseph A. Koncelik, Worthington; David B. Chaney, Powell, both of Ohio, and Walter G. Lockard, Quakertown, Pa., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sep. 18, 1980, Ser. No. 188,474

Int. Cl.³ A47B *81/00*; E06B *9/14*

U.S. Cl. 312—238 **7 Claims**



1. An assembly for storing clothing or other articles in a nursing home or the like and comprising: a first wall panel; a second wall panel mounted to said first wall panel so that they are substantially perpendicular to each other; a storage structure including a plurality of walls defining a storage structure having a polygon shape in cross-section, said structure including a front wall having an access opening defined therein; means for selectively blocking or unblocking said access opening, said means comprising a tambour door; a pair of track

structures for mounting said tambour door along two sides thereof on opposite sides of said access opening, said track structures having at least two 90° turns defined thereby and disposed within the interior of said storage structure; and means for mounting said storage structure to said wall panels so that said tambour door tracks are disposed in horizontal planes vertically spaced from each other, said mounting means comprising hanger means for hanging said storage structure on said wall panels.

4,360,241

INSTRUMENT PANEL

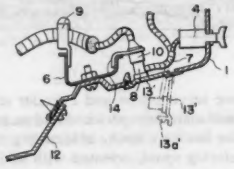
Yukio Fukunaga, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 29, 1980, Ser. No. 154,276

Claims priority, application Japan, Apr. 6, 1979, 54-68840

Int. Cl.³ H01R *33/00*

U.S. Cl. 339—10 **9 Claims**



1. A structure including, in combination:

an instrument panel for an automotive vehicle having a vehicle body,

a harness being composed of a first lead wiring and a second lead wiring, the former being provided to the vehicle body, the latter being provided to the instrument panel,

a plate for covering a large opening formed between said vehicle body and the lower edge of said instrument panel;

a bracket extending laterally along the lower edge of said instrument panel between both sides of the vehicle body and being fixedly supported by said vehicle body for fixedly supporting said instrument panel at its lower portion;

a first connector attached to an end of said first lead wiring;

a second connector attached to an end of said second lead wiring, said second connector being connectable with said first connector;

the lower portion of said instrument panel facing downward and having a small opening near said bracket;

said first connector being fixed relative to the bracket in such a way that the connecting point of said first and second connectors is positioned near said small opening in said lower portion of said instrument panel; and

a lid for covering said small opening in said lower portion of said instrument panel said second connector being fixed to the backside of the lid and placed in such a position that, when said lid is closed, said second connector can be automatically connected with said first connector.

4,360,242

SELF-FASTENING ELECTRICAL CONNECTOR

John M. Poliak, East Meadow, and Juan M. Lopez, Jamaica, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

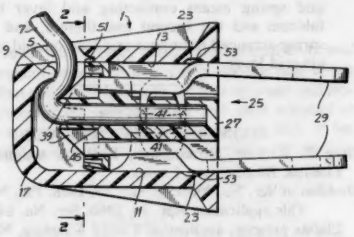
Continuation of Ser. No. 165,324, Jul. 2, 1980, abandoned. This application Aug. 10, 1981, Ser. No. 291,682

Int. Cl.³ H01R *11/20, 13/38*

U.S. Cl. 339—99 R **1 Claim**

1. In an electrical connector comprising a housing having a bore substantially rectangular in cross-section and defining interior surfaces including opposite side walls, a floor, a ceiling and a rear wall, the exterior of said housing having an aperture communicating with said bore for admitting an insulated wire therethrough, a plug assembly adapted to be inserted into the bore of said housing, said plug assembly having a moulded body and at least one conductive electrical contact means pivotally mounted in said body for movement between an open position and a closed position and extending from said bore when in said closed position with said plug assembly fully inserted in said bore, said body having a channel adjacent said contact means and adapted to receive a length of insulated wire when said contact means is in said open position, said contact means having at least one protuberance extending therefrom adapted to pierce the insulation of said wire and engage said wire for electrical contact when said wire is in said channel and said contact means is moved from said open position to said closed position, the improvement which comprises:

first cooperating means on at least one of said interior surfaces of said housing and on said plug assembly for releasably entrapping said body in said housing upon insertion of said plug assembly in said housing, including a protuberance resiliently mounted on one of a surface of said plug assembly and a notch on the interior surface of said housing, an opposite side of said interior surface having a notch adapted to receive said protuberance, said cooperating means on said plug assembly being integral with said body, said wall of said housing having said wire admitting aperture adapted to receive a narrow flat tool between said wall and said wire, said tool penetrating the bore of said housing sufficiently to contact said wire adjacent said body, the interior surface of said housing adjacent said wire aperture having mounted thereon a fulcrum means about which said tool can be pivoted against said wire and said body to urge said protuberance out of said notch while urging said plug assembly away from said housing rear wall and out of said housing, said cooperating means on said plug assembly being integral with said contact means, said protuberance being urged out of said notch upon urging of said contact means towards said closed position.



4,360,243

THREADED LAMP ADAPTER

George E. Johnson, Bronxville, and Walter Newman, Forest Hills, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Dec. 1, 1980, Ser. No. 211,620

Int. Cl.³ H01R *13/02*

U.S. Cl. 339—154 L **10 Claims**

1. A connector for adapting a lamp to be threaded into a lighting fixture comprising:

a body adapted to receive first electrical conductor means connectable to an energizing terminal of said lamp,

a sleeve having threads at least on its exterior surface for connection to a threaded light socket and rotatably mounted on said body, said body including retaining means for limiting axial movement between said body and said sleeve,

first resistance means on said body member, and second resistance means on said sleeve member, said first and

second resistance means operating to increase the torque necessary to rotate said sleeve is in a predetermined disposition relative to said body, said first electrical conducting

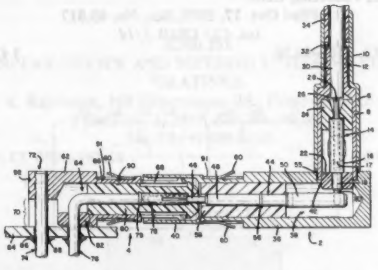
means being connected to said retaining means, said retaining means being conductive and urged against said sleeve for maintaining electrical contact with said sleeve as said sleeve is rotated relative to said body.

4,360,244

MINIATURE COAXIAL CONNECTOR ASSEMBLY

Edgar W. Forney, Jr., Harrisburg, and Richard S. Hogendobler, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 12, 1980, Ser. No. 149,073
Int. Cl.³ H01R *17/04*
U.S. Cl. 339—177 R **6 Claims**



1. A right angle coaxial cable connector comprising:

first tubular conductive body means having a profiled passageway extending lengthwise therein from a forward end to a rearward end and an opening extending through said first tubular conductive body means proximate said rearward end and communicating with said passageway;

dielectric means in said passageway;

a first electrical contact means disposed in said dielectric means isolating said first contact means from said tubular conductive body means and having forward contact means and rear contact means in alignment with said opening;

second tubular conductive body means secured on said first tubular conductive body means around said opening and having a crimping section onto which outer conductor means of coaxial cable means is to be crimpably secured;

dielectric member means in said second tubular conductive body means; and

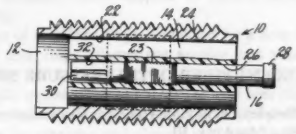
second electrical contact means disposed in said dielectric member means isolating said second electrical contact means from said second tubular conductive body means and having inner contact means in electrical engagement with said rear contact means and outer contact means for electrical connection with the center conductor of the coaxial connector means.

4,360,245

COAXIAL CONNECTOR

Nick C. Nikitas, Danvers, Mass., assignor to Delta Electronics Mfg. Corp., Beverly, Mass.

Filed Jul. 7, 1980, Ser. No. 166,355
Int. Cl.³ H01R *13/40*
U.S. Cl. 339—218 R **7 Claims**



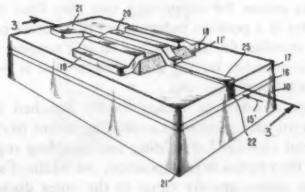
1. A coaxial connector for microwave applications comprising an outer conductive shell having an internally roughened surface, an externally roughened inner conductor, a tubular insulator of synthetic resin interposed between the shell and the inner conductor, a layer of adhesive resin cement between the insulator and the shell and another layer of adhesive resin cement between the inner conductor and the insulator, the layers of adhesive cement being the sole bonds between their respective adjacent parts.

4,360,246

INTEGRATED WAVEGUIDE AND FET DETECTOR

Luis Figueroa, Woodland Hills; Charles W. Slayman, Newbury Park, and Huan-Wun Yen, Westlake Village, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 23, 1980, Ser. No. 152,977
Int. Cl.³ G02B *5/174*
U.S. Cl. 350—96.12 **23 Claims**



1. A monolithic integrated optical photodetector comprising:

(a) a substrate of semi-insulating III–V semiconductor material;

(b) a confinement region of mixed III–V semiconductor material on at least a portion of said substrate;

(c) a waveguiding region of mixed III–V semiconductor material supported on said confinement region and adapted to receive and guide incident optical radiation; and

(d) at least one detector supported on at least a portion of said waveguiding region and adapted to receive guided optical radiation, said detector including an active region of III–V semiconductor material supported on said wave-

guiding region and a pair of electrodes contacting said active region.

2. The device of claim 1 comprising:

(a) a substrate of semi-insulating GaAs;

(b) a confinement region of undoped $Al_xGa_{1-x}As$ supported on at least a portion of said substrate, where x is at least about 0.42;

(c) a transverse waveguiding region of undoped $Al_yGa_{1-y}As$ supported on said confinement region, where y is at least about 0.37 and is about 5 to 10% less than x;

(d) means for confining incident optical radiation in the lateral direction; and

(e) at least one detector supported on at least a portion of said waveguiding region, including

(i) an active region of n-type GaAs, and

(ii) a pair of electrodes contacting said active region.

4,360,247

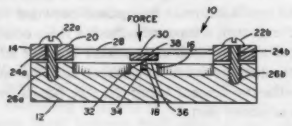
EVANESCENT FIBER OPTIC PRESSURE SENSOR APPARATUS

J. Donald Beasley, Arlington Heights, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 19, 1981, Ser. No. 225,892

Int. Cl.³ G01L *9/00*; G02B *7/26*

U.S. Cl. 350—96.15 **7 Claims**



1. An apparatus for sensing pressure by using optical evanescent wave coupling between two fiber optic waveguides of the type having a portion of the cladding material removed along a finite length of each of the fiber optic waveguides defining a coupling region for each waveguide, said two fiber optic waveguides having said coupling regions placed in juxtaposition to effectuate optical evanescent wave coupling therebetween, said apparatus comprising:

support means for supporting said two fiber optic waveguides in a position independent of external pressures;

upper member fixedly attached to said support means, said upper member having a diaphragm that is responsive to external pressures; and

pressure transmitting means fixedly attached to said diaphragm, said pressure transmitting means having a longitudinal channel for holding said coupling region of said two fiber optics in juxtaposition, the width of said channel being approximately equal to the outer diameter of the coupling region of one of said fiber optic waveguides, the depth of said channel being less than the summation of the outer diameters of the coupling regions of said two fiber optic waveguides so that said coupling region of one of said fiber optic waveguides will protrude beyond the surface of said pressure transmitting means and be in slight engagement with said support means when said fiber optic waveguides are placed in said channel of said pressure transmitting means, such that any external pressures upon said diaphragm will cause said pressure transmitting means to force said coupling region of said two fiber optic waveguides into closer communication thus changing the amount of optical evanescent wave coupling therebetween.

4,360,248

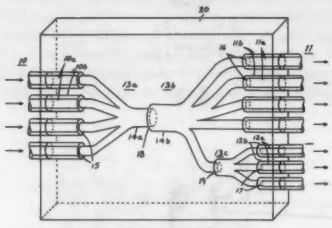
MULTIPORT OPTICAL COMMUNICATION SYSTEM AND OPTICAL STAR STRUCTURE THEREFOR

Gary W. Bickel, and David L. Baldwin, both of Roanoke, Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 31,264, Apr. 18, 1979, abandoned. This application Feb. 12, 1981, Ser. No. 233,754

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.16 **8 Claims**



1. A star coupler for an optical communication system which includes an optical bundle having a plurality of light-transmitting fibers each having a core and a cladding comprising in combination:

means for balancing optical power among said plurality of fibers comprising a length of said fibers wherein said cladding has been removed and said cores have been fused together to form a homogeneous mixing section having a cross-section substantially equal to the sum of the areas of the unclad fibers, and

a common cladding means positioned around said means for balancing.

4,360,249

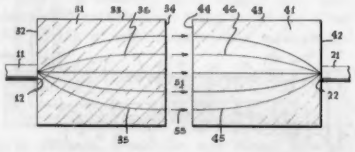
OPTICAL FEEDTHROUGH FOR PRESSURE VESSELS

Charles S. Siemon, Encinitas, Calif., assignor to Tetra-Tech, Inc., Pasadena, Calif.

Filed Oct. 17, 1979, Ser. No. 85,817

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.18 **1 Claim**



1. A bulkhead optical-circuit feedthrough for operatively coupling two optical fibers on opposite sides of a bulkhead of a pressure hull, and for use with light having a specified nominal wavelength, the feedthrough comprising:

two cylindrical graded-index rods, each of which has at least one polished flat end and an axis perpendicular thereto, and each of which rods is equal in length to one focal length at such nominal wavelength;

each of such two optical fibers being permanently cemented to a respective one of said rods, at the opposite end from said polished end thereof, and with the axis of each such fiber substantially at the axis of the corresponding rod;

a window forming a portion of such bulkhead and defining two opposite optical surfaces;

two strong, rigid plates forcibly securing the window to adjoining portions of such bulkhead, both the window and the plates being large-diameter, plate-shaped structures

applied parallel to such bulkhead in a reinforcing configuration; and

the plates defining a pair of accurately paraxial cylindrical channels, each snugly enclosing a respective one of the rods and thereby aligning the first and second rods so that said polished ends face each other with their respective polished ends accurately parallel, the said window being interposed between the two facing ends of the two rods so that each of said two window surfaces is adjacent a respective one of said polished rod ends.

4,360,250

OPTICAL WAVEGUIDES

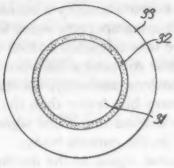
David N. Payne, Southampton, and William A. Gambling, Chandlers Ford, both of England, assignors to National Research Development Corp., London, England

Filed May 28, 1975, Ser. No. 581,472

Claims priority, application United Kingdom, May 31, 1974, 24177/74; Aug. 7, 1974, 34813/74; Dec. 30, 1974, 55999/74

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.30 **27 Claims**



27. An optical waveguide comprising a core of glass formed of phosphorus pentoxide and silica and a cladding of a glass of a lower refractive index than the core.

4,360,251

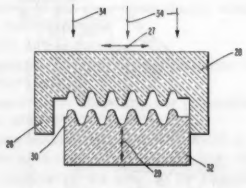
DISPLAY DEVICE AND METHOD UTILIZING PHASE GRATINGS

Jan A. Rajchman, 268 Edgerstoune Rd., Princeton, N.J. 08540

Filed Nov. 2, 1979, Ser. No. 90,662

Int. Cl.³ G02B *5/18*

U.S. Cl. 350—162.18 **43 Claims**



1. A light valve comprising a pair of transparent sheets in close juxtaposition to each other, each sheet carrying on the side facing the other sheet two or more surface relief phase gratings, said gratings on each sheet being superimposed on each other with lines of any one grating making an angle to the lines of the others of the same sheet, and said gratings having like periodicity and identically oriented with the lines on one sheet being parallel to the lines of the other.

4,360,252

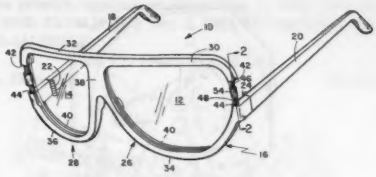
EYEGLASS FRAME HAVING REMOVABLE LENS

Charles I. Solomon, San Antonio, Tex., assignor to Sol-Optics, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 189,229, Sep. 22, 1980, which is a continuation-in-part of Ser. No. 124,541, Feb. 25, 1980, Pat. No. 4,304,469. This application Aug. 14, 1981, Ser. No. 292,891

Int. Cl.³ G02C *1/08*

U.S. Cl. 351—95 **8 Claims**



1. An eyeglass frame adapted to receive removable lens comprising:

a. a pair of split lens rings connected by a nose bridge, said split lens rings adapted to receive and retain eyeglass lenses;

b. temple means secured to each of said lens rings;

c. at least one turnbuckle connected to said pair of split lens rings for opening and closing said split in said split lens rings to allow said eyeglass lenses to be retained or removed from said split lens rings, said turnbuckle forming an integral part of said split rings and capable of being loosened or tightened by hand without the aid of a separate instrument.

4,360,253

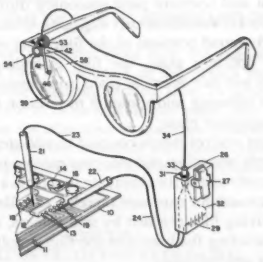
SAFETY GLASS MOUNTED TEST RESULT INDICATOR

Kenneth L. Wyatt, Oklahoma City, Okla., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,403

Int. Cl.³ G02C *1/00*; G01R *19/14*

U.S. Cl. 351—158 **8 Claims**



1. A test device for attachment to eyeglass frames, which comprises:

a light emitting diode;

a clip for attachment to the eyeglass frames;

means secured to the clip for supporting the diode in close proximity to a lens in the frame and inside the normal focus distance of a user's eye;

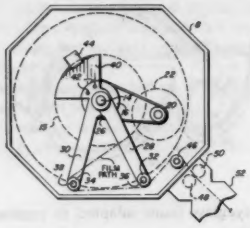
a pair of electrically conductive probes; and

a test device interconnected between the probes and the light emitting diode for operating the light emitting diode upon the probes ascertaining a predetermined test condition.

4,360,254
CAMERA HAVING STEPPER MOTOR DRIVEN FILM TRANSPORT/REGISTRATION SPROCKET

Bengt E. Nyman, Tempe, Ariz., and Jerry H. Lehmann, Rochester, N.Y., assignors to Mangum-Sickles Industries, Inc., Tempe, Ariz.

Filed Mar. 27, 1980, Ser. No. 134,565
Int. Cl.³ G03B 1/00
U.S. Cl. 352—166 **1 Claim**



1. A camera for taking a plurality of exposures upon a continuous length of film, the film having sprocket holes along at least one edge thereof, said camera comprising in combination:

(a) a sprocket for engaging the sprocket holes in the film, said sprocket causing the film to be transported through said camera when said sprocket is rotated;

(b) exposure means for selectively exposing a portion of film for a variable length of time, said exposure means including an aperture plate having an aperture therein for exposing a portion of film adjacent the aperture, said aperture plate including registration pins for engaging the sprocket holes in the film;

(c) guide means for guiding the film transported through said camera past the aperture of said exposure means;

(d) a movable pressure plate positioned on a side of the film opposite said aperture plate for urging the film against said registration pins during each exposure of the film;

(e) a stepping motor having a shaft coupled to said sprocket for rotating said sprocket by a predetermined incremental angle between exposures while maintaining the portion of film adjacent said aperture plate stationary during an exposure, said sprocket simultaneously engaging sprocket holes within first and second portions of the film lying on opposite sides of said aperture plate, the film extending between said sprocket and said aperture plate being maintained as a tight loop for allowing said sprocket to position the film relative to said aperture plate;

(f) transport control means coupled to said stepping motor for selectively actuating said stepping motor; and

(g) film supply means for supplying film from a film supply reel to said camera for exposure thereby, and film take-up means for receiving film exposed by said camera, said film supply means isolating the inertia of the film supply reel from said sprocket and including:

(i) drive means for supporting the film supply reel containing the film to be exposed by said camera and for rotating the film supply reel to unwind film contained thereby;

(ii) a movable roller engaging the film unwound from the film supply reel, said movable roller being displaced by the film as the film is withdrawn from said film supply means;

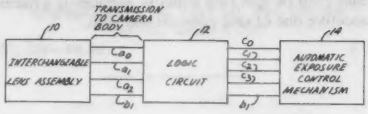
(iii) a ferrous metal member attached to said movable roller for movement therewith; and

(iv) a magnetic sensor for sensing the position of said ferrous metal member and actuating said drive means in accordance therewith.

4,360,255
METHOD AND APPARATUS FOR TRANSMISSION OF INFORMATION IN A PHOTOGRAPHIC CAMERA

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 286,332
Claims priority, application Japan, Jul. 31, 1980, 55-105527
Int. Cl.³ G03B 7/20
U.S. Cl. 354—23 D **3 Claims**



1. In a photographic camera having a camera body, an interchangeable lens assembly mounted on the camera body, and an automatic exposure control mechanism located in the camera body, the mechanism responding to a first binary signal representative of a maximum lens aperture value in binary code and a second binary signal representative of a minimum lens aperture value in binary code, the first signal having a given number of binary bits, a method comprising the steps of:

generating in the lens assembly a second signal representative of the minimum aperture value for the lens assembly;

generating in the lens assembly a third signal representative of the arithmetic difference between the first and second signals for the lens assembly, the third signal having a number of binary bits fewer than the given number;

transmitting the second and third signals generated in the lens assembly to the camera body;

applying the second signal to the mechanism;

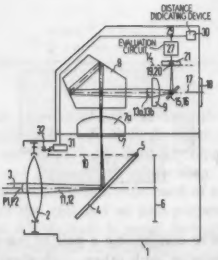
arithmetically adding the transmitted second and third signals to derive the first signal for the lens assembly; and

applying the derived first signal to the mechanism.

4,360,256
SINGLE REFLEX CAMERA WITH AN OPTOELECTRONIC DISTANCE METER MOUNTED IN THE VICINITY OF THE VIEW FINDER EYEPIECE

Hans-Peter Grassl, Zorneding, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,403
Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018564
Int. Cl.³ G03B 3/10, 13/06, 13/16
U.S. Cl. 354—25 **18 Claims**



1. A photographic or electronic camera with an optoelectronic distance measuring system, comprising: a picture-taking focal plane and lens means spaced therefrom in a path of rays of an object and having two partial aperture diaphragm means associated therewith for creating first and second partial bun-

dles of rays corresponding to first and second images of the object which are to be projected onto two linear image sensors, each having a plurality of sensor elements; an evaluating circuit means connected to the image sensors and which in dependence upon varying position displacements of images and their corresponding sensor signals obtained from the one image sensor with respect to sensor signals obtained from the other image sensor determines a maximum correlation between the signals and an associated position displacement with a corresponding electrical value being formed indicative of distance of the object from the camera; device means for selectively deflecting the ray path at least partially to a view finder for single reflex operation; between said device means and the view finder a condensing lens; an eyepiece of the view finder; two focusing lens parts arranged in a path of rays of the eyepiece of the view finder, said lens parts locating the partial aperture diaphragms and associated first and second partial bundles of rays; and in a path of said partial bundles of rays which penetrate said lens parts, deflection element means being provided which deflect the paths of rays onto the image sensors.

4,360,257

RESETTING APPARATUS FOR SINGLE LENS REFLEX PHOTOGRAPHIC CAMERA

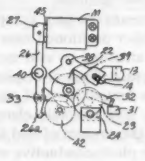
Hiroshi Kurei, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1981, Ser. No. 258,044

Claims priority, application Japan, Apr. 30, 1980, 55-59667[U]

Int. Cl.³ G03B *7/00, 19/12*

U.S. Cl. 354—36 **5 Claims**



1. In a single lens reflex photographic camera including a shutter release for opening a shutter and a diaphragm, the combination comprising:

a mirror movable between a first position for view finding and a second position for film exposure;

means responsive to the shutter release for placing the mirror in the second position;

a diaphragm stop down gear;

means responsive to the gear upon shutter release for stopping down the diaphragm;

a magnetic core and armature;

means for magnetically repelling the armature from the core during shutter opening;

means for magnetically attracting the armature to the core prior to and after shutter opening;

a pivotal locking lever having a locking tooth at one end and the armature at the other end, the locking tooth being so positioned relative to the gear to be rotatable with the locking lever in a first direction into engagement with the gear when the armature is repelled by the core, and in a second direction out of engagement with the gear when the armature is attracted by the core;

a shutter completion mechanism actuated after exposure;

means responsive to the actuation of the shutter completion mechanism for rotating the locking lever in the second direction to mechanically drive the armature against the core and placing the mirror in the first position; and

a shutter charging pin;

means responsive to the shutter charging pin for rotating the locking lever in the second direction to mechanically drive the armature against the core.

4,360,258

LENS SHUTTER MECHANISM FOR CAMERA

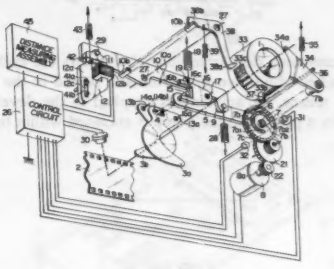
Akihiko Hashimoto, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Jul. 31, 1981, Ser. No. 289,084

Claims priority, application Japan, Oct. 2, 1980, 55-138604; Oct. 2, 1980, 55-141291[U]; Oct. 2, 1980, 55-141292[U]; Oct. 2, 1980, 55-141293[U]

Int. Cl.³ G03B *3/10, 9/08*

U.S. Cl. 354—195 **10 Claims**



1. A lens shutter mechanism for a camera, comprising:

a shutter blade adapted to be opened and closed to permit an exposure of a film surface;

a shutter opening/closing lever moand connected to said shutter blade in such a manner that said shutter blade opens when said shutter opening/closing lever is moved in said first direction and said shutter blade closes when said shutter opening/closing lever is moved in said second direction;

shutter opening drive means for operating the shutter opening/closing lever in said first direction to open the shutter blade;

a movable shaft on which the shutter opening/closing lever is pivotally mounted;

a shutter close lever carrying the movable shaft on its one end;

means for urging the shutter close lever for angular movement along a first direction of an arc, which movement causes the shutter opening/closing lever to move in said second direction to close said shutter blade; and

an electromagnet for attracting an armature mounted on the shutter close lever to constrain the shutter close lever against the angular movement in said first direction of said arc.

4,360,259

DIAZO DEVELOPING APPARATUS

Dennis A. Burgess, 14980-18th Ave. No., Plymouth, Minn. 55441, and Kenneth D. Rebers, 9016-31st Ave. No., New Hope, Minn. 55427

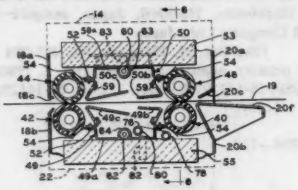
Filed Feb. 13, 1981, Ser. No. 234,203

Int. Cl.³ G03D *7/00*

U.S. Cl. 354—299 **14 Claims**

1. A diazo sheet material developer comprising an inner ammonia developing chamber, means for supplying ammonia vapor thereto for developing said diazo sheet material as it passes through the developing chamber, said developer having sheet material inlet and outlet apertures, sheet feeding means for passing said diazo sheet material through said apparatus, and said developer having an outer vapor collection and disposal plenum surrounding and enclosing the developing chamber for collecting and removing ammonia vapor, said collec-

tion plenum having openings therein to admit outside air and an air blower means communicating with said outer plenum for drawing air from the outside atmosphere in through said openings and for expelling the air and any vapor therein to a vapor disposal means, whereby ammonia vapor that escapes



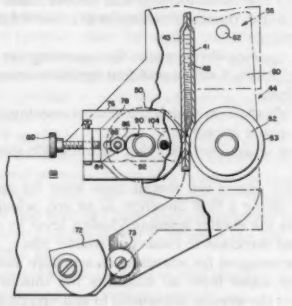
from the ammonia developing chamber enters the collection plenum and is withdrawn therefrom and passed to the vapor collection means, the ammonia is supplied to the developing chamber by a pump and the pump is enclosed within the plenum.

4,360,260

SPREADER ROLLER SYSTEM HAVING ADJUSTABLE ROLLER GAP

Vaito K. Eloranta, Needham, and John W. Ford, Jr., Framingham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 5, 1981, Ser. No. 308,423
Int. Cl.³ G03D *9/02*
U.S. Cl. 354—304 **7 Claims**



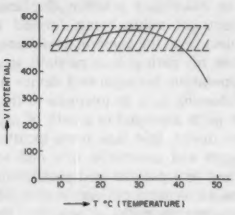
1. In a photographic apparatus having means for spreading processing fluid in a layer of predetermined thickness between a pair of superposed film sheets as the sheets travel therethrough, the spreading means including a pair of pressure members mounted in juxtaposed relationship with at least one of said members being movable with respect to the other, means for yieldably biasing said members toward each other, and means for spacing apart said members to define a gap therebetween and thereby establish the thickness of the spread layer of fluid, the improvement wherein said spacing means includes an adjustable gap setting assembly having a plurality of preset positions each of which define different predetermined spacings between said members such that any one of said spacings may be selected in accordance with the selected position of said assembly to define selected thicknesses of the fluid layer and accommodate different predetermined film sheets.

4,360,261

EXPOSURE APPARATUS FOR COPYING MACHINES

Mitsuaki Kohyama, Higashikure, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 7, 1980, Ser. No. 176,096
Claims priority, application Japan, Aug. 14, 1979, 54/103264
Int. Cl.³ G03G *15/04*
U.S. Cl. 355—3 R **5 Claims**



1. In an electrostatic copying machine having a photoconductive member, charge means for applying a uniform electrostic charge to the photoconductive member, exposure means for exposing the charged photoconductive member to a light image and producing an electrostatic latent image on the photoconductive member, and developer means for developing the electrostatic latent image, said exposure means comprising:

a light guiding means for guiding said light image onto said photoconductive member, said light guiding means including a variable aperture means having at least one movable element for varying the amount of light reaching said photoconductive member,

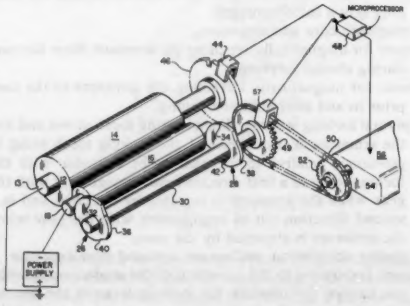
said light guiding means further comprising a thermally metamorphic member positioned near said photoconductive member and attached to said movable element and capable of undergoing physical displacement upon exposure to changes in temperature of said photoconductive member, whereby said movable element undergoes displacement to vary the amount of said light as a function of temperature of the photoconductive member.

4,360,262

ELECTROPHOTOCOPIER CHARGING AND TRANSFER ROLLER

James E. Genthe, Southbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 24, 1980, Ser. No. 200,114
Int. Cl.³ G03G *15/02, 15/14*
U.S. Cl. 355—3 CH **8 Claims**



1. In combination, a photoconductive surface, a carbon loaded, elastomeric roller having two levels of impedance

under two distinct loading conditions situated adjacent said photoconductive surface, and means for generating two different loading conditions on said roller to thereby produce said two levels of impedance, wherein when said roller is subjected to the lower level of loading said roller is operable for charging said photoconductive surface and when said roller is subjected to the higher level of loading said roller is operable for transferring a developed image from said photoconductive surface to a receiver sheet.

4,360,263

COPYING APPARATUS

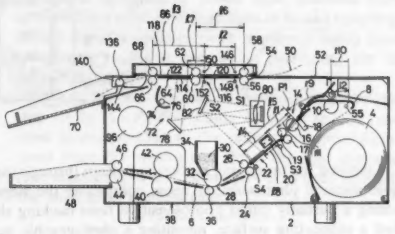
Yoshitake Miyoshi, Nara; Jiro Fujii, Kadoma; Tsugio Nakanishi, Neyagawa; Ichiro Takahashi, Kadoma; Hideaki Tsudaka, and Masami Kai, both of Neyagawa, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Apr. 7, 1980, Ser. No. 137,981

Claims priority, application Japan, Apr. 10, 1979, 54-44775; Apr. 10, 1979, 54-44776; Apr. 10, 1979, 54-44777; Sep. 26, 1979, 54-124402

Int. Cl.³ G03B *29/00*

U.S. Cl. 355—29 **11 Claims**



1. In a copying apparatus employing a roll of copy paper, the improvement comprising:

a copy paper cutting device provided along a copy paper passageway for cutting said roll of copy paper during a copying operation;

detecting means provided upstream of said copy paper cutting device, with respect to a transport direction along said copy paper passageway, for detecting a final trailing edge of said roll of copy paper;

driving means for driving an original document or an optical device of the apparatus;

detecting means for detecting a moving position of said original document or said optical device;

means for operating said copy paper cutting device when said moving position detecting means detects a predetermined position of said original document or said optical device;

means for stopping said driving means when said final trailing edge of said roll of copy paper is detected by said final trailing edge detecting means; and

copy paper transport means for transporting said copy paper from a frame of the copying apparatus when the leading edge of said copy paper passes through said copy paper cutting device, and when said final trailing edge of said copy paper is detected by said final trailing edge detecting means.

4,360,264

VARIABLE MAGNIFICATION SLIDE COPY CAMERA

Philip G. Baker, Peabody, and Gerald L. Matthews, Raynham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 31, 1981, Ser. No. 288,820

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—40 **10 Claims**

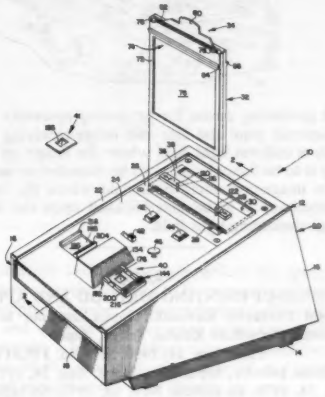
1. A copy camera operative in at least two different magnification modes for selectively varying the size of an object projected onto a film unit, said copy camera comprising:

a support member;

a projection lens, having a given focal length, mounted at a fixed location on said support member;

means for supporting a film unit alternatively at either of first and second film planes spaced at different predetermined fixed image distances from said lens for exposure to an image provided thereby;

means for supporting an object alternatively at either of first and second object planes spaced at different predetermined fixed object distances from said lens, said different image and object distances being selected so that in one



magnification mode an image of an object located at said first object plane is focused by said lens at said first film plane and is of a size predetermined by a first magnification factor and in another magnification mode an image of an object located at said second object plane is focused at said second film plane and is of a size predetermined by a second magnification factor that is different than said first magnification factor; and

exposure control means operable for controlling transmission of image forming light rays from an object at either of said first and second object planes to a corresponding one of said first and second film planes to effect exposure of a film unit thereat.

4,360,265

APPARATUS FOR PRODUCING MICROFORM RECORDS FROM HARD COPY, CATHODE RAY TUBE IMAGE OR TRANSPARENCY DATA-CONTAINING SOURCES

Gary Lewis, St. Clair Shores, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

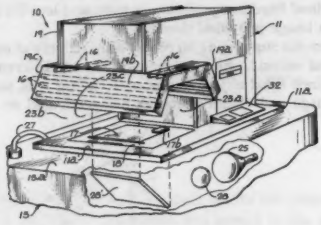
Continuation-in-part of Ser. No. 98,388, Nov. 29, 1979, abandoned. This application Jan. 21, 1980, Ser. No. 113,647

Int. Cl.³ G03B *27/52, 27/70*

U.S. Cl. 355—43 **17 Claims**

1. In an apparatus for producing microform records from light reflecting hard copy wherein a light image reflected from the hard copy is reduced to micro-image size and applied at a film imaging station to film means which is photosensitive to an image by the light reflecting hard copy, said apparatus including a hard copy-supporting station including a generally horizontal, opaque, hard copy-supporting platform, lighting means mounted above said platform which lighting means is to be energized when a record of a piece of hard copy placed on said platform is to be made, an image-receiving and projecting means for receiving hard copy reflected light from a piece of hard copy placed on said platform and for providing a micro-

image thereof directed upon said film means, the improvement wherein said platform is mounted for movement between an operative horizontal position at said supporting station and a position removed therefrom, a transparent plate provided at said supporting station exposed when said platform is removed therefrom for placement of a transparency thereon, and light



field producing means for projecting upwardly through said transparent plate and into said image-receiving means selectively a uniform light field where the image on the transparency is to be the only image to be recorded on said film means or an image-containing light field where the image on said transparency is to be superimposed upon the image of said image-containing light field.

4,360,266

CONTACT PRINTING METHOD AND APPARATUS

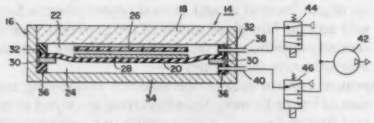
Satoshi Takeuchi, Kawasaki, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1980, Ser. No. 179,517

Claims priority, application Japan, Aug. 24, 1979, 54-107957; Aug. 24, 1979, 54-107958; Nov. 10, 1979, 54-145934; May 23, 1980, 55-68505

Int. Cl.³ G03B *27/20, 27/02*

U.S. Cl. 355—91 **9 Claims**



1. In a contact printing method wherein an original and a light-sensitive material are placed in superposition in a vacuum chamber formed between a light-transmitting plate and an elastic diaphragm, with the original being disposed closer to the light-transmitting plate, the improvement which comprises:

(a) providing a second vacuum chamber disposed opposite to the first recited vacuum chamber across the diaphragm,

(b) evacuating the first and the second vacuum chambers similtaneously;

(c) causing the light-transmitting plate and the diaphragm to press the original and the light-sensitive material into close, uniform contact with each other by introducing atmospheric pressure into the second vacuum chamber; and

(d) exposing the light-sensitive material to light through the light-transmitting plate and the original.

5. In a contact printing apparatus of the type having a vacuum chamber formed between a light-transmitting plate and an elastic diaphragm for accomodating an original and a light-sensitive material in superposition, the improvement comprising:

(a) means for defining a second vacuum chamber disposed opposite to the first recited vacuum chamber across the diaphragm;

(b) means for evacuating the first and second vacuum chambers simultaneously; and

(c) means for introducing thereafter atmospheric pressure into the second vacuum chamber, whereby the original and light-sensitive material in the first vacuum chamber can be urged into close, uniform contact with each other by first simultaneously evacuating the first and second vacuum chambers and then by introducing atmospheric pressure into the second vacuum chamber.

4,360,267

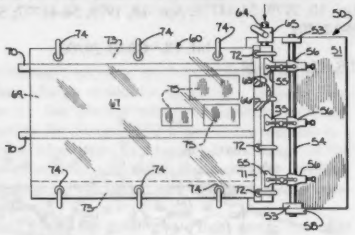
METHOD AND APPARATUS FOR PRODUCING PRINTING PATTERNS

Daniel R. Nettesheim, New Berlin, and Robert R. Guyer, Hartland, both of Wis., assignors to Schwaab, Inc., Milwaukee, Wis.

Division of Ser. No. 132,816, Mar. 24, 1980, Pat. No. 4,311,381. This application Jan. 15, 1982, Ser. No. 339,461

Int. Cl.³ G03B *27/02*

U.S. Cl. 355—132 **9 Claims**



1. A method for producing a printing pattern through use of a liquid uncured photosensitive resin, comprising the steps of disposing a partially cured photosensitive resin backing sheet against a supporting surface, mounting a photographic negative containing indicia in spaced aligned relation with said backing sheet to provide a closed chamber therebetween, introducing a liquid uncured photosensitive resin into said chamber, exposing portions of said liquid uncured resin through said photographic negative to ultra-violet light to thereby cure said portions and to fully cure the partially cured resin of the backing sheet and provide a hardened pattern having off-set indicia, the unexposed portion of said liquid uncured resin remaining in an uncured state, and removing the uncured resin from the pattern.

4,360,268

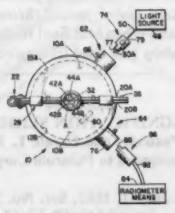
METHOD AND APPARATUS FOR MEASURING THE INSERTION LOSS OF A SPLICE IN AN OPTICAL FIBER

Joseph Zucker, Foster City, and Arthur H. Fitch, Redwood City, both of Calif., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Nov. 10, 1980, Ser. No. 205,844

Int. Cl.³ G01N *21/84*

U.S. Cl. 356—73.1 **11 Claims**



1. The method of measuring the insertion loss of a splice

between adjacent one ends of first and second optical fibers comprising the steps of:

producing a first measurement of the radiant power of light emitted from the one end of the first fiber prior to forming the splice, said first named producing step comprising inserting the one end of the first fiber into an input port of an integrating light enclosure for converting emitted radiant light power into diffuse light in the latter, and coupling only diffuse light (associated with emitted light) from the integrating enclosure for use in producing the first measurement;

producing a second measurement of the radiant power of light scattered from the splice, for light in the one end of the first fiber that produces the first measurement being incident on the splice, said second named producing step comprising separating parts of an integrating enclosure from each other along a line therethrough; locating the first and second spliced fibers along the line so that they extend over associated wall portions of the integrating enclosure with the splice located within the latter; placing the separated parts of the integrating enclosure together over the first and second fibers for producing a relatively light-tight enclosure in which light scattered from the splice is converted to diffuse light in it; and coupling only diffuse light (associated with scattered light) from the integrating enclosure for use in producing the second measurement; and

determining the insertion loss of the splice from the relationship 10 *log* $(1-Ps/Po)$, where Ps is the second measurement (corresponding to the radiant power of light scattered from the splice) and Po is the first measurement (corresponding to the radiant power of light emitted from the one end of the first fiber).

4,360,269

APPARATUS FOR INSPECTING DEFECTS IN A PERIODIC PATTERN

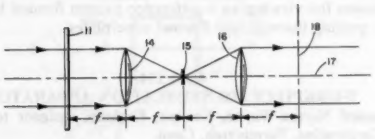
Akito Iwamoto, Kamakura, and Hidekazu Sekizawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 30, 1980, Ser. No. 202,320

Claims priority, application Japan, Nov. 7, 1979, 54/143228

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—239 **9 Claims**



1. In an apparatus for inspecting defects in a periodic pattern, an optical device comprising:

a light source for directing a coherent light beam toward the periodic pattern;

a Fourier transformer positioned to receive and transform the coherent light beam after it strikes the periodic pattern, said Fourier transformer generating a defect information light component and a periodic pattern information light component, the periodic pattern information light component including zeroth order diffraction light and first and higher order diffraction light; and

filtering means positioned at the backward focal point of said Fourier transformer and having a light blocking area for blocking transmission of first and higher order diffraction light and a circular light transmission area for passing zeroth order diffraction light and the defect information light component.

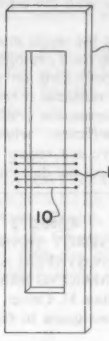
4,360,270

CALIBRATION AND TESTING DEVICE FOR OPTICAL, SINGLE PARTICLE, SIZE SPECTROMETERS

Richard K. Jeck, 197 W. Paddock Cir., Arnold, Md. 21012

Filed Feb. 17, 1981, Ser. No. 234,500

Int. Cl.³ G08B *17/10*

U.S. Cl. 356—243 **12 Claims**

10. A method for calibrating single particle size spectrometers of the type wherein particles to be measured are directed through a sampling chamber transversely through a collimated light beam, and wherein light scattered or intercepted by the measured particles is monitored by a detector which provides an indication of the sizes and/or number of said measured particles, said method comprising the step of:

passing at least one translucent fiber, having uniform optical characteristics, transversely through said light beam in said sampling chamber in a direction nominally normal to the fiber length while noting the indication provided by said detector.

4,360,271

INTERFEROMETER SYSTEMS

Michael J. Downs, Headley Down, and Kenneth W. Raine, Twickenham, both of England, assignors to National Research Development Corporation, London, England

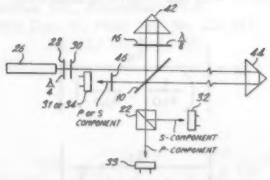
PCT No. PCT/GB79/00006, § 371 Date Sep. 13, 1979, § 102(e) Date Aug. 9, 1979, PCT Pub. No. WO79/00506, PCT Pub. Date Aug. 9, 1979

PCT Filed Jan. 11, 1979, Ser. No. 167,066

Claims priority, application United Kingdom, Jan. 13, 1978, 01448/78

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—351 **7 Claims**



1. An improved interferometer system comprising:

a Michelson interferometer comprising a single interferometer beam splitter and two reflecting means arranged to receive radiation from opposite sides of the beam splitter and to return radiation to the same areas of those sides whereby two exit beams of radiation are provided, one from each side of the beam splitter;

a beam splitting and polarising means arranged to receive

one exit beam and to separate the received radiation into radiation at two orthogonal directions of polarisation whereby two optical interferograms are provided;

means arranged to receive the other exit beam and to separate from it radiation at one of said orthogonal directions of polarisation whereby a third optical interferogram is provided, the third interferogram being in phase quadrature with one of the first and second interferograms, and being in antiphase with the other of the first and second interferograms;

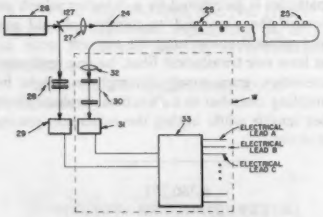
characterised in that the single interferometer beam splitter has for radiation at each orthogonal direction of polarisation reflection coefficients on its two faces which are equal, and has for radiation at one orthogonal direction of polarisation a transmission coefficient which is equal to the reflection coefficient, whereby the two reflecting means each receive and return radiation having components at both orthogonal directions of polarisation.

4,360,272

FIBER OPTIC ENERGY SENSOR AND OPTICAL DEMODULATION SYSTEM AND METHODS OF MAKING SAME

Donald Schmadel; William H. Culver, and Gordon Gould, all of Gaithersburg, Md., assignors to Optelecom, Inc., Gaithersburg, Md.

Filed Mar. 20, 1980, Ser. No. 132,274
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—352 **14 Claims**



1. The method of spectrally amplifying the spectral shift of the transmission peaks of a Fabry-Perot interferometer comprising:

projecting or guiding wavelength scanned electro-magnetic radiation into the said Fabry-Perot interferometer;

projecting the spectrally shifted transmitted output peaks of the Fabry-Perot interferometer into an analyzer Fabry-Perot interferometer; and

constructing the cavity length of said Fabry-Perot interferometer and said analyzer Fabry-Perot interferometer in accordance with the following equations:

$$T_R \approx \left| \frac{S_R}{\left(\frac{1}{\lambda_{1D}} - \frac{1}{\lambda_{2D}}\right)} \right| \quad \text{EQ IX}$$

$$T_A \approx \left| \frac{S_A}{\left(\frac{1}{\lambda_{1D}} - \frac{1}{\lambda_{2D}}\right)} \right| \quad \text{EQ X}$$

$$\Delta\lambda_{SA} \approx U\Delta\lambda_{SR} \quad \text{EQ XI}$$

$$U \approx \frac{fS_R}{fS_R - S_A} \quad \text{EQ XII}$$

for

$S_A = (f)(S_R) \pm 1$

and

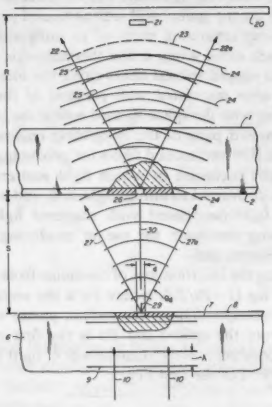
S_A and $S_R > 2$ and f is a positive integer.

4,360,273

OPTICAL ALIGNMENT OF MASKS FOR X-RAY LITHOGRAPHY

James B. Thaxter, Townsend, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,350
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—354 **9 Claims**



1. Apparatus for aligning a first planar optically transparent element with respect to a second planar optically transparent element disposed in substantially parallel relation comprising:

first and second thin films affixed to major adjacent surfaces of said first and second planar elements respectively,

said films being provided with first and second apertures respectively, each of said apertures containing a Fresnel zone plate,

means for illuminating said Fresnel zone plate with collimated light, and

means for viewing an interference pattern formed by light passing through said Fresnel zone plates.

4,360,274

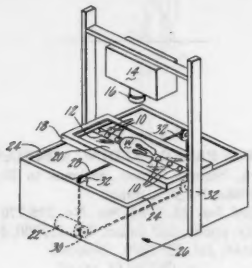
WORKPIECE IDENTIFICATION APPARATUS

Leonard Norton-Wayne, London, England, assignor to USM Corporation, Farmington, Conn.

Filed Jan. 2, 1981, Ser. No. 222,180
Claims priority, application United Kingdom, Jan. 9, 1980, 8000663
Int. Cl.³ G01B *11/00*
U.S. Cl. 356—394 **13 Claims**

1. Apparatus for use in identifying to which of a number of predetermined types a workpiece belongs, the apparatus being operable in a learning mode in which it is presented with a workpiece of each of the predetermined types in order to learn those workpieces or in an identifying mode in which it identifies workpieces presented thereto by comparison with the learnt workpiece, the apparatus comprising a light source, an array of light detectors each operable to detect whether a workpiece is present on the optical path between the light source and the detector, moving means operable to cause relative movement such that a workpiece moves across the optical paths between the light source and the detectors, recording means operable to record after each unit distance of movement caused by the moving means which of the detectors

detects a workpiece, calculating means operable, when the apparatus is in the learning mode, to calculate, from the data recorded by the recording means, a predetermined set of parameters of the workpiece, selecting means operable, when the apparatus is in the learning mode and after the calculating means has calculated a set of parameters for all the workpieces to be learnt, to select a sub-set of the parameters such that the sub-set formed by those parameters for each learnt workpiece differs from every other such learned sub-set in at least a number of respects equal to twice a preselected acceptable error



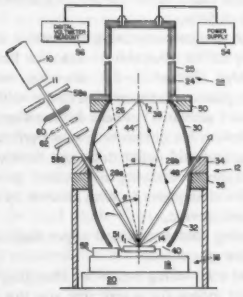
plus one, where the preselected acceptable error is a number selected as the number of the parameters which it is acceptable to erroneously determine, the calculating means being operable in the identifying mode to calculate the parameters of the workpiece which form an equivalent sub-set to the learnt sub-sets, and comparing means operable in the identifying mode to compare the equivalent sub-set with the learnt sub-sets and in the event of finding identity with the sub-set of a workpiece of a particular type except for a number of differences not greater than the acceptable error to identify the workpiece as being of that particular type.

4,360,275

DEVICE FOR MEASUREMENT OF OPTICAL SCATTERING

Anthony W. Louderback, Ojai, Calif., assignor to Litton Systems Inc., Beverly Hills, Calif.

Filed Aug. 11, 1980, Ser. No. 176,880
Int. Cl.³ G01N *21/47*; G02B *5/10*
U.S. Cl. 356—446 **9 Claims**



1. A device for measuring light scattered from a sample surface comprising:

(a) a substantially ellipsoidal reflector having a first aperture adjacent a first focus of said substantially ellipsoidal reflector for receiving a sample to be measured and a second aperture adjacent a second focus of said ellipsoidal reflector, said substantially ellipsoidal reflector additionally having an entrance hole and an exit hole through which a light beam respectively enters and exits said ellipsoidal reflector;

(b) light source means for producing a collimated light beam directed along a path passing through said entrance hole of said substantially ellipsoidal reflector and through the vicinity of said first focus of said substantially ellipsoidal reflector;

(c) mounting means for positioning said sample surface substantially at said first focus and for orienting said surface so that the portion of said light beam which is specularly reflected from said sample is directed out of said exit hole; and,

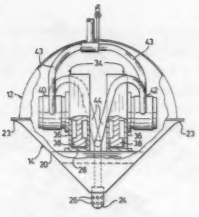
(d) photoresponsive means positioned at said second aperture for detecting at least most of the light scattered from said incident light beam by said sample surface which reaches said second aperture.

4,360,276

METHOD AND APPARATUS FOR CREATING A PATH THROUGH PARTICULATE MATERIAL

James M. Jack, Georgetown, Canada, assignor to Northern Vibrator Manufacturing Ltd., Georgetown, Canada

Filed Mar. 23, 1981, Ser. No. 246,556
Int. Cl.³ B01F *13/02, 11/00*
U.S. Cl. 366—101 **11 Claims**



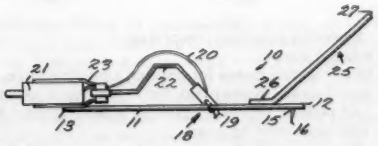
1. Apparatus for creating a path through particulate material such as granular or pulverulent material in a storage container, said apparatus being lowerable into the material in the container and comprising an upper part attachable to a lowering device and a lower part, the lower part having a downwardly and inwardly inclined outer wall extending to a lower central area, vibrator means for vibrating said outer wall along a substantially vertical axis, when the apparatus is suspended from the lowering device, air nozzle means at the lower central area, and means for supplying air to said air nozzle means.

4,360,277

PORTABLE FABRIC TEMPERATURE PROFILER

Vernon T. Daniel, Oak Ridge; Edward J. Robbins, and Kenneth Y. Wang, both of Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Dec. 31, 1980, Ser. No. 221,811
Int. Cl.³ G01K *13/06*
U.S. Cl. 374—137 **21 Claims**



1. A method of obtaining a temperature profile of a moving fabric web in a textile treating assembly utilizing a temperature sensing probe interconnected by a reeled wire to a monitor, comprising the steps of:

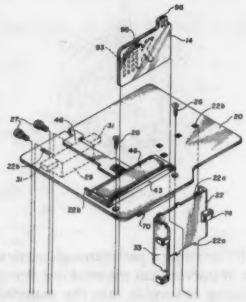
(a) without arresting the fabric web movement, placing the temperature sensing probe—with wire attached—in operative engagement with a specific point of the fabric web, the probe maintaining contact with that point of the web and moving therewith into the entrance of the textile treating assembly;
(b) effecting unreeling of the wire as the probe moves with the fabric web through the textile treating assembly;
(c) continuously monitoring the temperature of the specific point of the fabric web as the fabric web moves through the textile treating assembly by monitoring the temperature data supplied by the probe;
(d) without arresting the fabric web movement, disconnecting the probe from the web after it exits the textile-treating assembly; and
(e) reeling up the wire.

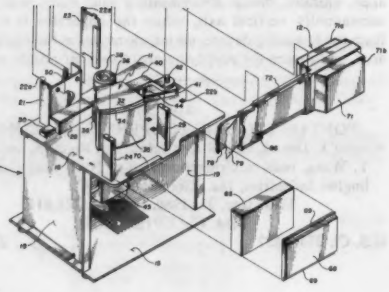
4,360,278

PRINTING APPARATUS HAVING INTERCHANGEABLE LARGE CHARACTER TYPE FONTS AND TAPE-RIBBON CARTRIDGE THEREFOR

Michael W. Paque, Stillwater, Minn., assignor to Kroy Inc., St. Paul, Minn.

Filed Dec. 17, 1979, Ser. No. 103,749
Int. Cl.³ B41J *1/30*
U.S. Cl. 400—134.3 **20 Claims**





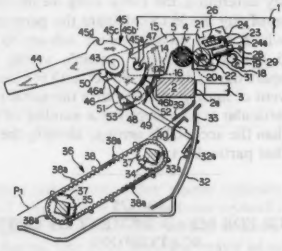
1. A printing apparatus comprising:
a printing station;
a force resisting means for resisting a printing force;
a force exerting means positioned in printing alignment with said printing station for exerting a printing force toward said force resisting means;
an interchangeable font element having a raised character positionable in printing alignment with said printing station; and
a removable cartridge having a housing containing a supply of image carrying tape and a tape and font guide portion integrally connected with and extending outwardly from said housing, said tape and font guide portion positionable between said force resisting means and said force exerting means and including an opening to define said printing station, said tape and font guide portion further including a pair of spaced guide edges for guiding said interchangeable font element into printing alignment and a support edge for supporting said interchangeable font element during a printing cycle.

4,360,279

PRINTING PAPER FEEDING MECHANISM

Toshiro Sugiura, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 22, 1981, Ser. No. 275,770
Claims priority, application Japan, Jul. 2, 1980, 55-91069; Jul. 10, 1980, 55-94144; Jul. 10, 1980, 55-94145
Int. Cl.³ B41J *11/48*
U.S. Cl. 400—600.2 **11 Claims**



1. A printing paper feeding mechanism for a printer comprising:
a perforated paper feed device provided with a pin tractor, for feeding a web with holes perforated at periodic locations along both edges toward a printing position, fittable into said perforations;
a paper draw-out device comprising a rotatable drive roller and a pressure roller, abuttable thereto for being able to rotate associated therewith, for drawing out a paper printed at the printing position therefrom while holding said paper under pressure between both rollers;
a transmitting device for connecting said perforated paper feeding device and said paper draw-out device to impart larger amount paper drawing out action to said paper draw-out device than paper feeding amount by said perforated paper feed device;
a motor for driving said perforated paper feed device and said upper draw-out device;
a rotation amount controlling means for changing amount of rotation of said motor for a unit line spacing amount in response to the type of paper fed, such that fed amount of paper in either case wherein the perforated paper is fed by said perforated paper feed device and said paper draw-out device and wherein a cut shet paper is fed by said paper draw-out device alone may be made equal; and
a pressure controlling means for changing contact pressure of said pressure roller to said drive roller to a weaker level, while paper feeding by said perforated paper feed device is conducted, than that in otherwise operation.

4,360,280

MECHANICAL PENCIL HAVING A LEAD DETECTOR

Tomozo Sekiguchi, Soka, and Junichi Hashimoto, Saitama, both of Japan, assignors to Pentel Kabushiki Kaisha, Japan

Filed May 14, 1980, Ser. No. 149,562

Claims priority, application Japan, May 15, 1979, 54-64345[U]

Int. Cl.³ B43K *29/00*

U.S. Cl. 401—194 9 Claims

1. A mechanical pencil including a hollow cylindrical pencil body, a ferrule member connected to one end of the pencil body and carrying a lead guide sleeve in alignment with the axis of the pencil body, a cylindrical lead stowage housing disposed within the pencil body and having one end located at the other end of the pencil body and capable of being opened, a lead feeder mounted in the pencil body and connected to the other end of the lead stowage housing and including a collet chuck which is supported to be movable in the axial direction of the pencil body together with the lead stowage housing, operating means for driving the collet chuck axially of the pencil body in order to feed a writing lead contained in the stowage housing to the exterior thereof through the guide sleeve, a power supply in the form of a cell or storage battery contained in the pencil body, an electrical indicator adapted to be energized from the power supply, and means for providing an electrical interconnection between the power supply and the indicator, the interconnection means including a first channel associated with one of the poles of the power supply and including the collet chuck and the lead guide sleeve, both of which are formed of an electrically conductive material and also including a second channel associated with the other pole of the power supply and including a switch which is operated in response to an operation of the operating means, the first channel being rendered conductive through a writing lead whenever the writing lead is engaged with both the collet chuck and the lead guide sleeve, the second channel being rendered conductive through the switch whenever the operating means is actuated, the indicator being operated in response to the conduction of both the first and the second channel.

4,360,281

REVERSIBLE CAM LOCK ASSEMBLY

J. Douglas Alsup, Jr., and Arden F. Jenkins, both of Bay Minette, both of Ala., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 24, 1980, Ser. No. 172,034

Int. Cl.³ F16B *2/18*

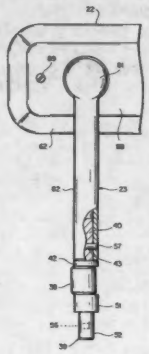
U.S. Cl. 403—4 14 Claims

1. A cam lock assembly comprising:

shaft means having a first end and a second end, said first end and said second end each being adapted for attachment to a first member;

a cam eccentrically mounted on said shaft means intermediate said first and second ends, said cam being adapted for engaging a surface of a second member; and

means securing said cam to said shaft means, whereby said cam



cooperates with the surface of the second member to resist clockwise rotational movement of the first member relative to the second member when said first end of said shaft means is attached to the first member and counterclockwise rotational movement of the first member relative to the second member when said second end of said shaft means is attached to said first member.

4,360,282

FITTING FOR CONNECTING TWO VERTICALLY ABUTTING BODIES OF FURNITURE

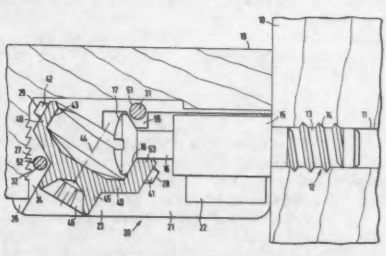
Gerhard Koch, Motzingen, Fed. Rep. of Germany, assignor to Hafele KG, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 242,033

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009380

Int. Cl.³ B25G *3/00*

U.S. Cl. 403—19 14 Claims



1. Connection fitting for disconnectibly joining two vertically abutting pieces of furniture in their region of contact, in which one furniture body is provided with a projecting fastener stud having a fastening head thereon, and the other furniture body is provided with a cup-shaped casing in a cavity enclosing rotatably mounted tensioning means, and in which the head of the fastener bolt is in operative connection with the tensioning means and is adapted to be pulled into the casing by the rotational movement of the tensioning means, characterized in that the tensioning means comprises a tensioning eccentric (40) which extends around and behind the fastening head (17) of a fastener bolt (12) by a tensioning sleeve (49) located eccentrically to the axis of rotation (44) of said eccentric, said

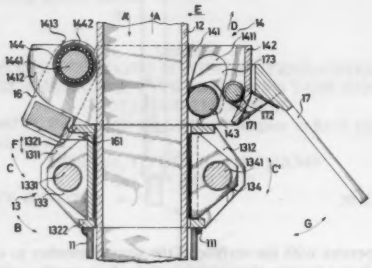
eccentric (40) being accessible from the exposed front side of said casing (20), and said fastener bolt (12) being insertable through the side wall of said casing (20).

4,360,283

TELESCOPIC STRUCTURAL SUPPORT

Ewald Psotta, Daubringen, Fed. Rep. of Germany, assignor to Ingenium Ingenieurgesellschaft für Mehrzweckbauten Industrieanlagen und Geländenutzung mbH, Bau-Kommanditgesellschaft, Lichtendorf, Fed. Rep. of Germany

Filed Sep. 20, 1979, Ser. No. 76,976
Int. Cl.³ F16B *7/10*; F16M *11/00*
U.S. Cl. 403—104 **8 Claims**



1. A structural support comprising: telescopic parts movable into one another and comprised of rectangular pipe members; one of said telescopic parts being an inner pipe member and movable outward; a self-actuated drive roller held in elongated holes inclined to an axis of said support for abutting against said inner pipe member; said drive roller being knurled; and roll bearing means for grasping said inner pipe member from behind and being a back counter bearing for said drive roller; to divided supporting rollers spaced one above the other for providing increased surface pressure capacity; roller holding means extending between divided portions of said supporting roller; and a transverse member connected to an outer pipe member and movable about a vertical axis for retaining said roller holding means; outward drive means for releasing said support; a housing on said outward drive means and on said outer pipe member of said support; a traverse member pivotable on one part of said housing and detachably fixed to another side part of said housing on an opposite side of said drive roller, said housing being freely removable to one side of the support.

4,360,284

BALL-JOINT ASSEMBLY

Darrell L. Brandenburg, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1980, Ser. No. 195,193
Int. Cl.³ F16C *11/00*; F16D *1/12*
U.S. Cl. 403—133 **2 Claims**

1. A ball-joint assembly including a bearing member for connecting a ball-stud member to a link and providing relative pivotal movement therebetween, said ball-stud member including a ball portion integrally connected to a neck portion, said link comprising a base plate portion which is formed with a plurality of tabs bent over for maintaining said bearing member in engagement with said base plate portion, said bearing member comprising a first socket portion formed with a first spherical bearing surface, a second socket portion formed with a second spherical bearing surface and having a cut-out portion for receiving said neck portion of said ball-stud member during assembly of said ball-stud member and said bearing member; a flexible web connecting said first and second socket portions and serving as a hinge for permitting said first and second socket portions to be coaxially aligned with said ball portion of said ball-stud member located between said first and second spherical bearing surfaces; and means formed with said base

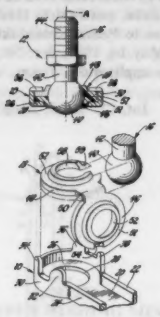


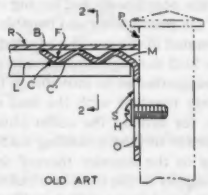
plate portion and cooperating with said flexible web for limiting relative movement between said bearing member and said link about the longitudinal axis of said ball-stud member.

4,360,285

RAIL AND POST CONNECTOR

Howard A. Magness, 24 Bonnie Ave., Bel Air, Md. 21014

Filed Jan. 9, 1981, Ser. No. 223,899
Int. Cl.³ F16B *7/08, 9/00*
U.S. Cl. 403—187 **1 Claim**



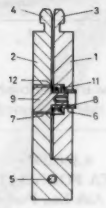
1. In a connector of bendable resilient material such as steel, for uniting a post with an abutting rail having in cross-section a base and arms defining a generally squared "U" shape, the connector being an elongate member with an angled middle dividing the elongate member into a first leg and a second leg; the first leg having shape for retention in a recess along and between the inside of the arms of the rail and means for resiliently tightening the first leg in the rail, and the second leg having means for securance to a post, the improvement comprising: the means for resiliently tightening comprising a plurality of integral barbs of said bendable resilient material extending at an incline from the upper surface of the first leg in position for contacting a said base when the first leg is in a said recess, means for adjusting said tightening including each of said extension being a free end of the barb and each barb having an end opposite the free end integral with the first leg, said end opposite bendable toward and away from the plane of the first leg; self draining means for said connector comprising each barb having an adjacent slot through the connector, means making the connector harder to pull out of a said rail than to insert therein, comprising said free end of each barb being toward said angled middle of the connector, said first leg being substantially straight, said barbs being in series on the centerline of said first leg, and said first leg having substantially parallel sides.

4,360,286

COUPLING ELEMENT FOR SUPPORTS HAVING AN UNDERCUT LONGITUDINAL GROOVE

Heinz Beer, Elz, Fed. Rep. of Germany, assignor to Syma Intercontinental AG, Kirchberg, Switzerland

PCT No. PCT/CH80/00022, § 371 Date Oct. 19, 1980, § 102(e) Date Oct. 10, 1980, PCT Pub. No. WO80/01709, PCT Pub. Date Aug. 21, 1980
PCT Filed Feb. 15, 1980, Ser. No. 198,000
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1979, 2906281
Int. Cl.³ F16B 7/04
U.S. Cl. 403—201 5 Claims



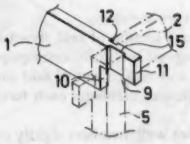
1. A connector for beams with a longitudinal undercut groove adapted to receive the connector comprising a first coupling element and a second coupling element adapted to swing transverse to the plane of the groove, each said connector element including a hook head of a thickness slightly less than half the width of the opening of said groove and an adjuster which includes a spring held in said first and second coupling elements, which adjuster resiliently biases said coupling element away from said second coupling element, said spring being capable of biasing apart the hook head of the first and second coupling elements by a distance that is, at least, greater than the width of the groove entry, said adjuster including a guide sleeve arranged between the spring and said first coupling element, the aforesaid guide sleeve being movable and protruding beyond the outer side of the first coupling element through a first bore, said first bore adapted to align with a third bore through the beam when in the connected position, such that a projecting portion of said guide sleeve can lock into said third bore.

4,360,287

DEVICE FOR FORMING CORNER JOINTS OF WALL ELEMENTS

Rolf E. Larsson, Langgatan 70, and Erik E. Eriksson, Svevägen 6, both of 830 60 Föllinge, Sweden

Filed Jul. 11, 1980, Ser. No. 167,480
Claims priority, application Sweden, Jul. 30, 1979, 7906485
Int. Cl.³ F16B 5/12
U.S. Cl. 403—219 2 Claims



1. A device for forming corner joints of wall elements comprising:

wall elements that are formed identical to one another, at least one end of each wall element being provided with one projection and one recess, the depth of the recess being determined by an edge surface of the wall element and being equal to half the width of the wall element taken in the transverse direction of the wall element, and the width of the projection being equal to the depth of the recess, the projection having two sides, one side of the projection being provided with a support groove and the other side of the projection being provided with a guide groove, the guide groove having a width equal to the thickness of the wall element and having a side substantially aligned with the edge surface of the wall element with the edge surface of one wall element being engagable in the guide groove of another wall element; and

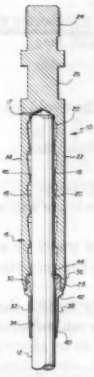
corner posts engagable in the support grooves of the wall elements.

4,360,288

FIBERGLASS SUCKER ROD CONSTRUCTION

Woodrow T. Rutledge, Jr.; Russell P. Rutledge; John E. Freeman, and Steven D. Clark, all of Big Spring, Tex., assignors to Fiberflex Products, Inc., Big Spring, Tex.

Filed Sep. 17, 1979, Ser. No. 76,373
Int. Cl.³ F16B 11/00; F04B 47/02
U.S. Cl. 403—268 10 Claims



1. A sucker rod construction for use in producing oil wells, said sucker rod construction comprising:

a first connector member being formed to define a rod receptacle having a closed axially outer end and an open axially inner end, said rod receptacle having a plurality of integrally formed axially spaced apart outwardly converging tapered frusto-conical annular surfaces, each of said surfaces having substantially the same taper;

a cylindrical fiberglass rod having an end having a uniformly cylindrical uninterrupted outer surface being received within said rod receptacle through said inner end and cooperating therewith to define an annular chamber between said outer surface of said end of said rod and said outwardly converging tapered frusto-conical surfaces;

and a body of initially liquid adhesive material filling said annular chamber that cures to bond to said outer surface of said end of said rod and to harden to form a plurality of shear and compression resistant frusto-conical wedges to cooperate with said frusto-conical surfaces.

4,360,289

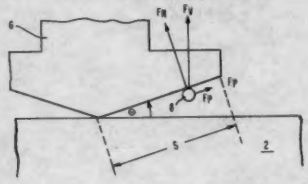
PIN FOR BRAZING TO A SUBSTRATE AND IMPROVED PACKAGE RESULTING THEREFROM

Armando S. Cammarano, Hyde Park, and Giulio DiGiacomo, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,643

Int. Cl.³ B25G *3/34;* **F16B** *11/00, 12/04;* **F16L** *13/00*

U.S. Cl. 403—272 **2 Claims**



1. As an article of manufacture, a substrate and a pin, one end of said pin being brazed to said substrate by a brazing material having a brazing temperature significantly below the melting point of said pin,

said one end of said pin having a substantial portion of its surface at an angle with respect to a plane perpendicular to the axis of the pin;

said angle being equal to or larger than an angle θ which satisfies the relationship

$$r = \left[\frac{9}{2}\left(\frac{\mu S \text{ cosecant } \theta}{t\rho g}\right)\right]^{\frac{1}{4}}$$

where:

r=the radius of the smallest void for which escape is desired to be reasonably certain,

μ=viscosity of the molten braze,

ρ=density of the braze,

g=acceleration due to gravity,

t=time during which the braze will remain in a molten state, and

S=maximum distance of travel by a void in order for it to escape from the braze between the end of the pin and the substrate;

whereby it is reasonably certain that the brazing material which joins said pin to said substrate will contain no voids having a radius equal to or greater than r.

4,360,290

INTERNAL PIPELINE PLUG FOR DEEP SUBSEA PIPE-TO-PIPE PULL-IN CONNECTION OPERATIONS

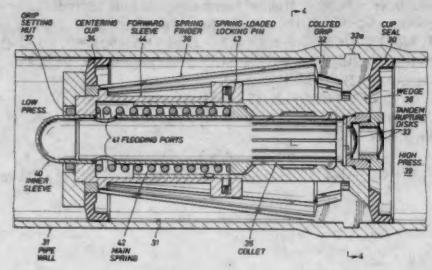
John M. Ward, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 17, 1980, Ser. No. 217,489

Int. Cl.³ F16L *1/04;* **B63B** *35/04*

U.S. Cl. 405—170 **12 Claims**

1. An internal pipeline capable of sealing, releasing and being pumped out of a pipeline comprising, means for sealing a high pressure side of the plug from a low pressure side, means for gripping the pipe wall, pressure release means operable at a set pressure to permit fluid passage, fluid flow control means operable to permit controlled passage of fluid therethrough and, means operable to release the gripping means from the



pipe wall when a set pressure relationship of the high pressure side to the low pressure side is attained.

4,360,291

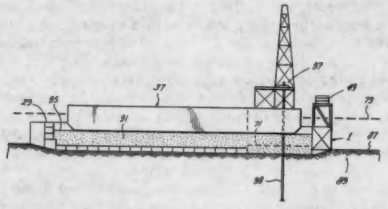
SUBSEA FOUNDATION

Alexis M. Cranberg, 127 Ash La., Portola Valley, Calif. 94205, and Edward D. Dysarz, P.O. Box 20129, Houston, Tex. 77025

Filed Jan. 7, 1980, Ser. No. 110,176

Int. Cl.³ E02D *23/02*

U.S. Cl. 405—205 **5 Claims**



1. A form for use on the bottom of a body of water for constructing an underwater foundation for offshore drilling or production equipment, comprising:

a rigid outer structure surrounding a space having a fixed area;

means for containing fill material in such space within said structure when said structure rests on such bottom of such body of water, said structure being sized to rest substantially completely below the surface of the water; and

buoyancy means located on said structure for controlling the buoyancy of said structure, the location of said buoyancy means being such that the ends of said structure can be sequentially sunk to and raised from such bottom of such body of water;

said rigid outer structure including

means for lowering a section of said structure and for permitting the passage of such offshore equipment over said lowered section and into or out of said form;

first and second sidewall members each having a front end and a rear end;

first and second front wall members rigidly connected to the front ends of said first and second sidewall members, respectively, there being a passageway between said first and second front wall members;

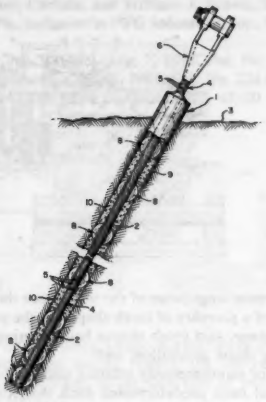
a front door member slidably pivotally connected to said first and second front wall members across said passageway; and

a rear door member releasably connected to said first and second sidewall members at the rear ends thereof.

4,360,292
GROUTED STRAND ANCHOR AND METHOD OF MAKING SAME

Andrew L. Keeler, 25-32 33d St., Astoria, N.Y. 11102, and Ronald Marsico, 2500 6th St., East Meadow, N.Y. 11554

Filed May 28, 1980, Ser. No. 153,956
Int. Cl.³ E02D 5/74
U.S. Cl. 405—244 **9 Claims**

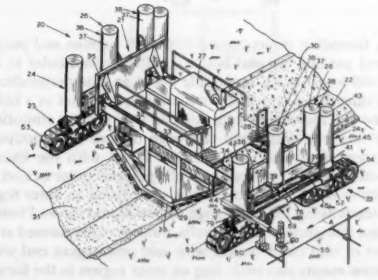


1. A grouted strand anchor for transferring tension load to the ground comprising an anchor hole drilled into the ground to a predetermined depth and a predetermined diameter, a predetermined length of strand having a plurality of pre-stretched, pre-twisted wires, a plurality of longitudinally spaced centering means engaging and surrounding said strand adapted to center said strand in said anchor hole, and grout surrounding and engaging said strand along its complete length in the hole, engaging said centering means and engaging the sides of the anchor hole whereby tension loads in said strand are transferred by shear forces in said grout to the sides of said hole.

4,360,293
CANAL PAVING MACHINE

Arthur W. Wade, Ida Grove, Iowa, assignor to Gomaco, Inc., Ida Grove, Iowa

Filed Aug. 18, 1980, Ser. No. 178,987
Int. Cl.³ E02B 5/02
U.S. Cl. 405—268 **5 Claims**

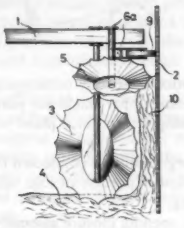


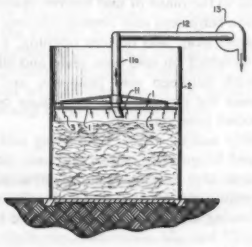
1. A canal paving machine comprising:
(a) an elongated main frame having a slip form mountable from the under side thereof;
(b) a pair of upright end frame structures for supporting the main frame in a position transversely of and above a canal to be paved, each end frame structure including an upper mounting section, a lower traction section and an intermediate connecting section;
(c) means movably supporting the upper section of one of said end frame structures on the main frame for movement of said one end frame structure longitudinally of the main frame to vary the traction tread of the machine;
(d) first coacting means on the lower section and intermediate section for vertically moving the intermediate section and upper section as a unit relative to the lower section, and
(e) second coacting means on the upper section and the intermediate section for vertically moving the upper section relative to the intermediate section and to the lower section as a unit,
(f) said first coacting means being alone operable during a paving operation in response to grade variations in the grade line of the canal being paved, and said first coacting means, and second coacting means being operable to extended positions therefor when a slip form is to be mounted on or removed from the main frame.

4,360,294
SILAGE EXTRACTION APPARATUS

Ernst-W. Ahrens, Melle, Fed. Rep. of Germany, assignor to Engelbrecht + Lemmerbrock GmbH + Co., Melle, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,754
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938280
Int. Cl.³ B65G 53/40, 65/38
U.S. Cl. 406—52 **3 Claims**





1. An apparatus for extracting silage for a cylindrical silo, comprising:
suction extractor pipe means having a suction aperture,
a plurality of supporting radial arms connected to said extractor pipe means,
conveying wheels freely and rotatably journalled on said radial arms and directly carrying the weight of the extracting apparatus,
said conveying wheels positioned obliquely with respect to the radius and axial plane of said silo for feeding silage material to said suction aperture,
a cutting wheel disposed in a plane above said conveying

wheels and freely and rotatably journalled on each of said radial arms at an extremity thereof next adjacent to the vertical wall of said silo, said cutting wheel being set at an angle of incidence with respect to the plane of circular translation of said conveying wheels as well as with respect to a plane parallel to the rotation plane of said radial arms, and

a spacing wheel disposed in a horizontal plane above said cutting wheel and supported against the vertical wall of said silo,

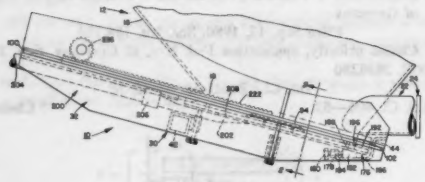
said cutting wheel being held at a small distance from the vertical wall of said silo, and being resiliently braced against the vertical wall of said silo by means of said spacing wheel.

4,360,295

COMBINATION GRAVITY/PNEUMATIC HOPPER BOTTOM

Arthur I. Anderson, St. Paul, Minn., assignor to North American Car Corporation, Chicago, Ill.

Filed Jun. 25, 1980, Ser. No. 162,887
Int. Cl.³ B65G *53/40*
U.S. Cl. 406—75 **26 Claims**



26. A hopper bottom assembly comprising:

a hopper wall having upper and lower portions which define a bottom opening slanted in a plane with respect to the horizontal;

a product discharge manifold connected to said hopper wall adjacent said lower portion of said wall and above said bottom opening;

a hopper bottom opening closure assembly mounted on said hopper wall and including a housing, a base plate slidably mounted in said housing to be moved in a plane substantially parallel to the plane of said bottom opening between a first position subjacent said bottom opening to a second position spaced from said bottom opening, a foraminous membrane mounted on said base plate and slidably movable therewith between said positions, and base plate moving means for moving said base plate between said first and second positions; and

closure assembly sealing means for sealing said closure assembly to said hopper wall when said base plate is in said first position so that a hopper can be unloaded pneumatically, said sealing means including a plurality of clamping means for forcing said base plate toward said hopper wall.

4,360,296

HOBBING APPARATUS WITH ORBITING HOB

George E. Fransson; Stuart J. Johnson, and Edward J. Haug, all of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

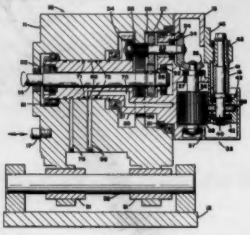
Division of Ser. No. 41,680, May 23, 1979. This application May 23, 1980, Ser. No. 152,902
Int. Cl.³ B23F *5/22*
U.S. Cl. 409—17 **9 Claims**

1. Apparatus for generating a plurality of teeth of gears, splines or the like spaced about the periphery of a non-rotating workpiece having an axis by orbiting a rotatable hob about the workpiece, said apparatus comprising:

a head rotatable about an axis of rotation which intersects said head and which is aligned with said workpiece axis;

means on said head for rotatably supporting a tooth generating hob eccentrically on said head and for rotation about an axis laterally displaced from and transverse to said workpiece axis such that said hob orbits around said axis of rotation of said head and said workpiece;

an actuator for moving at least one of said hob and said



workpiece lengthwise of the workpiece during the generation of a plurality of tooth shapes on the periphery of the workpiece, said tooth shapes being conjugate to the hob during shape generation; and

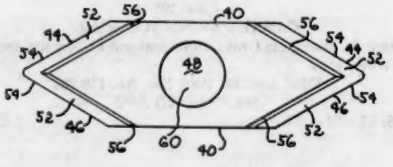
a drive for simultaneously rotating said head and said hob at a speed ratio predetermined such that for each orbit of said hob around said workpiece said hob revolves a plurality of revolutions determined by the number of teeth spaced about the periphery and generated thereby.

4,360,297

CUTTING INSERT

James H. Weber, El Toro, Calif., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 93,665, Nov. 13, 1979, abandoned, which is a continuation of Ser. No. 911,911, Jun. 2, 1978, abandoned. This application Sep. 4, 1981, Ser. No. 299,609
Int. Cl.³ B23P *15/28*; B23G *1/00*
U.S. Cl. 407—113 **2 Claims**



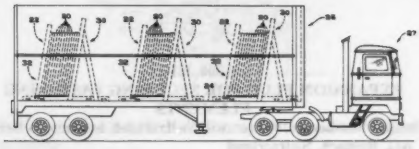
1. A threading insert having end wall regions and parallel sides and parallel top and bottom walls perpendicular to said sides, said insert being invertable about an axis perpendicular to said sides and adapted for mounting in a pocket in a holder with one end region exposed, said end wall regions comprising at least two end walls that converge toward one another as they extend from the center of the insert with the lines of intersection of said converging walls perpendicular to said top and bottom walls and recess means comprising an outer region that extends along the outer edge of one of said top and bottom walls and intersects said side walls, cutting edges formed at the juncture of said outer region with said convergent end walls, said recess means also including an inner region in the form of an abrupt rise extending substantially parallel to said converging end walls when viewed in top view leading from the lowermost part of said outer region upwardly to the plane of said one of said top and bottom walls and intersecting said side walls, said cutting edges effectively defining a plane that forms an acute included angle with the plane of said one of said top and bottom walls, said cutting edge plane inclined downwardly

toward the center of the insert, and a clamping notch formed in said one of said top and bottom faces for clamping said insert in the pocket.

4,360,298
TRAILER TRANSVERSE RACK ASSEMBLY FOR SHIPPING SHEETS

Wolfgang Fischer, Carlisle, and William J. Brown, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 931,709, Aug. 7, 1978, Pat. No. 4,273,485. This application Jan. 14, 1981, Ser. No. 224,979
Int. Cl.³ B60P *7/10*; B61D *3/16, 45/00*
U.S. Cl. 410—32 **3 Claims**



1. A method of assembling a rack on a flatbed of a vehicle for supporting glass sheets during transit, the flatbed having a longitudinal axis extending in the direction of vehicle travel, comprising the steps of:

detachably securing a pair of longitudinal runners in spaced relation to one another on the flatbed of the vehicle with their longitudinal axis generally parallel to one another and the longitudinal axis of the flatbed;

mounting a back support on the runners to define a tilted supporting plane with the supporting plane transverse to the longitudinal axis of the runners to provide the rack;

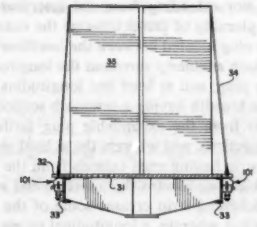
positioning peripheral edge portions of each glass sheet on the runners with major surface of each sheet generally parallel to the supporting plane to support the sheets in a generally upright position by the back support; and

securing the sheets in position on the rack.

4,360,299
SELF-RESETTING SNUBBING AND ANCHORING DEVICE

Rudolph E. Nadherny, Naperville, Ill., and Theodore J. Sweger, Lake Worth, Fla., assignors to Illinois Railway Equipment Company, Chicago, Ill.

Filed Sep. 22, 1980, Ser. No. 189,002
Int. Cl.³ B60P *7/10, 7/16*; B61D *3/16, 45/00*
U.S. Cl. 410—34 **24 Claims**



1. Self-resetting lading tie anchor and snubbing device for releasably anchoring lading strapping to railway freight cars, comprising:

a housing for securement to a railway freight car, said housing having an upper aperture therethrough;

a lading tie anchor assembly, at least a portion of which passes through said housing upper aperture, said lading tie anchor assembly being generally vertically movable between a generally retracted, locked position thereof and a generally extended, unlocked position thereof;

snubber means affixed to said lading tie anchor assembly, said lading tie anchor assembly transmitting tension within the lading strapping to said snubber means, and said snubber means maintaining tension in the lading strapping;

vertical movement constraint means for preventing upward passage of said lading tie anchor assembly completely out of said housing;

locking means for automatically setting said lading tie anchor assembly to said generally retracted, locked position and for releasing said lading tie anchor assembly to said generally extended, unlocked position to reduce the tension within the snubber means; and

said locking means includes a rotatably mounted latch having a deflection ledge in momentary operative interengagement with an assembly of the device that drops into said housing by gravitational forces.

23. The combination of a railway freight car of the type having a deck and a side sill with a device for securing cargo thereonto by lengths of lading strapping anchored by a quick-release device having receiving means for holding the lading strapping over the cargo, the quick-release device being a self-resetting device comprising:

a housing for securement to the side sill of the railway freight car, said housing having an upper aperture therethrough;

a lading tie anchor assembly, at least a portion of which passes through said housing upper aperture, said lading tie anchor assembly being generally vertically movable between a generally retracted, locked position thereof and a generally extended, unlocked position thereof, said generally retracted position being such that the device has a maximum height approximately equal to that of the side sill;

snubber means affixed to said lading tie anchor assembly, said lading tie anchor assembly transmitting tension within the lading strapping to said snubber means, said snubber means maintaining tension in the lading strapping;

vertical movement constraint means for preventing upward passage of said lading tie anchor assembly completely out of said housing;

locking means for automatically setting said lading tie anchor assembly to said generally retracted, locked position and for releasing said lading tie anchor assembly to said generally extended, unlocked position to reduce tension within the snubber means; and

said locking means includes a rotatably mounted latch having a deflection ledge in momentary operative interengagement with an assembly of the device that drops into said housing by gravitational forces.

4,360,300
SELF-RESETTING SNUBBING ANCHORING AND RELEASING LADING STRAPPING ON RAILWAY FREIGHT CARS

Rudolph E. Nadherny, Naperville, Ill., and Theodore J. Sweger, Lake Worth, Fla., assignors to Illinois Railway Equipment Company, Chicago, Ill.

Continuation-in-part of Ser. No. 189,002, Sep. 22, 1980. This application Aug. 20, 1981, Ser. No. 294,734
Int. Cl.³ B60P *7/10, 7/16*; B61D *3/16, 45/00*
U.S. Cl. 410—34 **16 Claims**

1. Self-resetting lading tie anchor and snubbing device for releasably anchoring lading strapping to railway freight cars, comprising:

a housing for securement to a railway freight car bed, said housing having a passageway through its upper end and an aperture through its lower end;

a lading tie anchor assembly, at least a portion of which passes through said housing passageway, said lading tie

anchor assembly being generally vertically movable between a generally retracted, locked position thereof and a generally extended, unlocked position thereof;

snubber means affixed to said lading tie anchor assembly, said snubber means including an elastomeric insert and an elongated mounting member, said elongated mounting member being slidably mounted through said aperture of the lower end of the housing, and said elastomeric insert being mounted on said elongated mounting member;

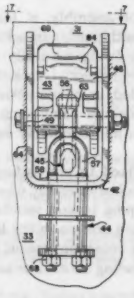
said lading tie anchor assembly transmitting tension within the lading strapping to said snubber means, and said snubber means maintaining tension in the lading strapping;

vertical movement constraint means for preventing upward passage of said lading tie anchor assembly completely out of said housing;

locking means for automatically setting said lading tie anchor assembly to said generally retracted, locked position and for releasing said lading tie anchor assembly to said generally extended, unlocked position to reduce the tension within the snubber means, said locking means including a surface for receiving generally downwardly directed forces for unlocking said device; and

said locking means includes a rotatably mounted latch having a deflection ledge in momentary operative interengagement with an assembly of the device that drops into said housing by gravitational forces.

14. The combination of a railway freight car of the type



having a deck and a side sill with a device for securing cargo thereonto by lengths of lading strapping anchored by a quick-release device having receiving means for holding the lading strapping over the cargo, the quick-release device being a self-resetting device comprising:

a housing for securement to the side sill of the railway freight car, said housing having a passageway through its upper end and an aperture through its lower end;

a lading tie anchor assembly, at least a portion of which passes through said housing passageway, said lading tie anchor assembly being generally vertically movable between a generally retracted, locked position thereof and a generally extended, unlocked position thereof, said generally retracted position being such that the device has a maximum height approximately equal to that of the side sill;

snubber means affixed to said lading tie anchor assembly, said snubber means including a resilient insert affixed to an elongated mounting member, said elongated mounting member being slidably mounted through said housing aperture, and said resilient insert being on said elongated mounting member;

said lading tie anchor assembly transmitting tension within the lading strapping to said snubber, and said snubber means maintaining tension in the lading strapping;

vertical movement constraint means for preventing upward passage of said lading tie anchor assembly completely out of said housing;

locking means for automatically setting said lading tie anchor assembly to said generally retracted, locked position and for releasing said lading tie anchor assembly to said generally extended, unlocked position to reduce the tension within the snubber means, said locking means including a surface for receiving generally downwardly directed forces for unlocking said device; and

said locking means includes a rotatably mounted latch having a deflection ledge in momentary operative interengagement with an assembly of the device that drops into said housing by gravitational forces.

4,360,301

EXPANSION PLUG FOR SECURING FASTENING ELEMENTS

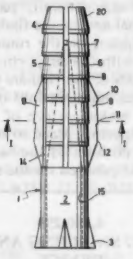
Clemens Mosberger, Witterswil, Switzerland, assignor to Bernal AG, Reinach, Switzerland

Continuation of Ser. No. 657,223, Feb. 11, 1976, abandoned. This application Jul. 14, 1980, Ser. No. 168,879

Claims priority, application Fed. Rep. of Germany, May 6, 1975, 2520019

Int. Cl.³ F16B *13/06*

U.S. Cl. 411—57 **4 Claims**



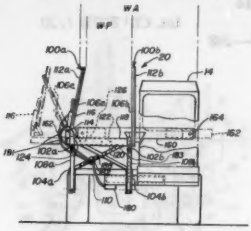
1. An elongated expandable plug having an insertion end, into which a screw is turned in a first direction, and a closed neck opposite the insertion end; a hollow internal cavity along the expandable plug longitudinal axis which is cylindrical within the closed neck and conical towards the insertion end; a longitudinal slot extending from the insertion end to the closed neck; a plurality of projections on the outer surface of the expandable plug located between the insertion end and the closed neck which annularly surround the longitudinal axis of the expandable plug; and at least one longitudinal thickening strip of uniform breadth having a sawtooth section and which extends radially from the expandable plug farther than the plurality of projections, and wherein the at least one longitudinal thickening strip having ends extends from the closed neck of the expandable plug toward the insertion end such that the at least one thickening strip crosses some of the plurality of projections, further wherein, a longitudinal recess is provided in the outer surface of the expandable plug along the length of the at least one thickening strip where the at least one thickening strip is integral with the expandable plug, wherein the longitudinal recess is provided in front of the at least one thickening strip as viewed in the first direction, and wherein the longitudinal recess has transverse grooves which are transverse to the longitudinal recess and are positioned at the ends of the at least one thickening strip, to provide greater folding capacity to the at least one thickening strip.

4,360,302

HYDRAULIC HOSE SLACK ADJUSTOR APPARATUS

Alan R. Askov, Fresno, and L. Dennis Butler, Kingsburg, both of Calif., assignors to Sperry Corporation, New Holland, Pa.

Filed Sep. 22, 1980, Ser. No. 189,512
Int. Cl.³ A01D 87/12; B60P 1/48
U.S. Cl. 414—24.5 6 Claims



1. Apparatus for bale handling including a slack adjustor comprising:

(a) a bed mounted on a frame;

(b) means for picking up a bale and depositing said bale on said bed, said means having a first width;

(c) means for adjusting said first width; said means for adjusting including a first portion, a telescoping second portion slidingly engaged with said first portion, and a pin removably inserted in selected ones of a plurality of matched holes in said first and second portions;

(d) a pivotal pickup arm connected to said second portion;

(e) means for hydraulically pivoting said arm, said means being a hydraulic cylinder;

(f) a source of hydraulic fluid;

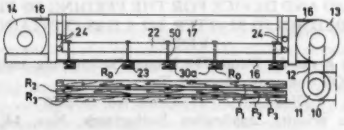
(g) means for conducting hydraulic fluid from said source to said cylinder, said means being at least one slack high pressure hose; and

(h) means for adjusting slack in said hose to correspond to the adjustment of said second portion relative to said first portion, said means for adjusting slack including a base portion connected to said means for picking up a bale and a loop-like portion connected to said base portion to encircle said at least one slack high-pressure hose and retain the position thereof relative to said base member.

4,360,303

METHOD AND APPARATUS FOR LOCATING SPACER STRIPS BETWEEN LAYERS OF TIMBER PACKAGES

Alpo Rysti, Friisiläntie 36, 02240 Espoo 24, Finland

Filed Mar. 18, 1980, Ser. No. 131,443
Claims priority, application Finland, Mar. 20, 1979, 790948
Int. Cl.³ B65G 57/26
U.S. Cl. 414—42 10 Claims

1. In a method whereby spacer strips are positioned between vertically adjacent layers of timer in timber packages including the steps of locating a plurality of spacer strips which are supported by distribution members over the topmost layer of a timber package, moving a plurality of depressor means operatively associated with a frame structure downwardly from an upper position so that respective depressor means engage respective spacer strips supported by said distributor members and conduct and guide the strips downwardly into position upon the topmost layer of the timber package while the distributor members which support the strips are at the same time withdrawn from their supporting positions, and then raising the depressor means back to the upper position whereupon the above steps are repeated, the improvement comprising:

arranging the depressor means in a manner such that as the depressor means move downwardly subsequent to engaging respective spacer strips, the frame structure with which the depressor means are associated remains substantially stationary and the downward motion of the depressor means comprises a free fall; and

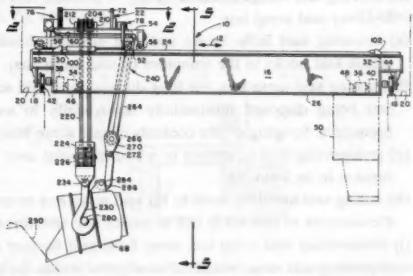
wherein during the downward movement of the depressor means, the spacer strips being conducted and guided thereby fall freely and are continuously and at all times guided at both the top and both sides thereof by the depressor means from the time the depressor means engage the spacer strips supported by said distributor members until the time the spacer strips engage the topmost layer of the timber package, whereby the spacer strips are accurately positioned upon the topmost timber package layer with any lateral movement of the spacer strips during downward movement or upon engagement with the topmost timber package layer due to bouncing being thereby eliminated.

4,360,304

EXTENDABLE CRANE TROLLEY AND METHOD

Bruce L. Brewer, Alliance, and Brooks E. Weingart, Sebring, both of Ohio, assignors to Amca International Corporation, Hanover, N.H.

Filed Sep. 26, 1980, Ser. No. 191,353
Int. Cl.³ B66C 17/08
U.S. Cl. 414—191 40 Claims



1. A horizontally extendable trolley suitable for transporting hot metal ladles and the like when operating in a retracted mode and elongated scrap boxes and the like when operating in an extended mode comprising

frame means and wheel means for supporting said frame means, hoisting means mounted on said frame means, means for driving said wheel means for supporting said frame means, and

a horizontally elongated trailer frame slidably mounted on said frame means, said trailer frame having a first end extending beyond an end of said frame means, auxiliary wheel means for supporting said first end, auxiliary hoisting means mounted on said trailer frame, means for horizontally extending said trailer frame outwardly from said frame means and retracting said trailer frame inwardly toward said frame means, said trailer frame being supported by movable means adapted for travel on first track means mounted on said frame means, and said wheel means for supporting said frame means and said auxiliary wheel means being adapted for travel along a second track means.

40. A method for charging a furnace with hot metal and solid scrap comprising

(a) providing a charging crane that includes a horizontally elongated bridge, means for suporting said bridge, means for horizontally moving said bridge, a horizontally extendable trolley mounted on said bridge and adapted for travel along said bridge, said trolley including a substantially rectangular trolley frame, wheel means for supporting said trolley frame, means for driving said wheel means, a horizontally elongated trailer frame slidably mounted on said trolley frame, said trailer frame having a first end extending beyond an end of said trolley frame and wheel means for supporting said first end, means for horizontally extending said trailer frame outwardly from said trolley frame and retracting said trailer frame inwardly toward said trolley frame, hoisting means mounted on said trolley frame, auxiliary hoisting means mounted on said trailer frame, a first plurality of ropefalls depending from said hoisting means, a second plurality of ropefalls depending from said auxiliary hoisting means, a ladle lifting beam suspended by said first plurality of ropefalls, said ladle lifting beam including a horizontally elongated member and a pair of parallel spaced ladle hooks depending from said elongated member, and an auxiliary hook suspended by said second plurality of ropefalls;

(b) positioning a scrap box containing solid scrap metal within the area serviced by said crane;

(c) extending said trailer frame outwardly from said trolley frame to permit said trolley to operate in its extended mode;

(d) moving said bridge and said trolley to position said trolley over said scrap box;

(e) lowering said ladle hooks and said auxiliary hook to attach said hooks to the trunnions of said scrap box;

(f) hoisting said scrap box, the long dimension of said scrap box being disposed substantially horizontally to avoid premature dumping of the contents of said scrap box;

(g) transporting said scrap box to a pouring point over the furnace to be serviced;

(h) raising said auxiliary hook to tilt said scrap box to cause the contents of said scrap box to empty into said furnace;

(i) transporting said scrap box away from said furnace and depositing said scrap box at a desired point within the area serviced by said crane;

(j) retracting said trailer frame inwardly toward said trolley frame to permit said trolley to operate in its retracted mode;

(k) positioning a hot metal transfer ladle within the area serviced by said crane;

(l) moving said bridge and said trolley to position said trolley over said ladle;

(m) lowering said ladle hooks and said auxiliary hook to attach said hooks to the trunnions of said ladle;

(n) hoisting said ladle in an upright position to avoid premature dumping of the contents of said ladle;

(o) transporting said ladle to a pouring point over the furnace to be serviced;

(p) raising said auxiliary hook to tilt said ladle to cause the contents of said ladle to empty into said furnace; and

(q) transporting said ladle away from said furnace and depositing said ladle at a desired point within the area serviced by said crane.

4,360,305

DISTRIBUTION APPARATUS FOR THROAT CLOSURES OF SHAFT FURNACES, IN PARTICULAR FOR BLAST FURNACE CLOSURES

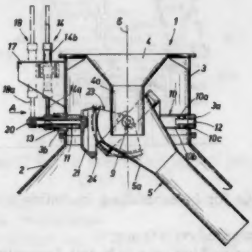
Georg Dorsch, Bad Homburg, Fed. Rep. of Germany, assignor to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,418

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 2927316

Int. Cl.³ F27B *1/20*

U.S. Cl. 414—208 8 Claims



1. A distribution apparatus for the top closures of shaft furnaces having furnace domes comprising:

(a) a funnel tube arranged at the entrance of said furnace dome;

(b) a distribution pipe extending below said funnel tube and capable of selectively directing charge material to a charging surface;

(c) said distribution pipe being pivotally supported by a pair of horizontal swivel pins to thereby enable said distribution pipe to swing about a horizontal axis passing through said swivel pins;

(d) a frame element supporting said swivel pins;

(e) said frame element being supported by a hollow shaft extending perpendicular to the horizontal axis passing through said swivel pins;

(f) said hollow shaft passing through said furnace dome;

(g) a swing drive connected to said hollow shaft for selectively rotating said distribution pipe about the axis passing through said hollow shaft;

(h) a pivot drive passing through said hollow shaft;

(i) said pivot drive having a first vertical drive disc;

(j) a second vertical drive disc connected to one pin of said pair of swivel pins; and

(k) power transmission elements serving to couple said first and second drive discs so that rotation of said pivot drive causes said distribution pipe to swivel about said horizontal swivel pins.

4,360,306

METHOD AND DEVICE FOR THE FEEDING OF FINELY DIVIDED SOLID MATTER TO A GAS-CONTAINING VESSEL

Maarten J. van der Burgt, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 27, 1980, Ser. No. 201,256

Claims priority, application Netherlands, Nov. 14, 1979, 7908314

Int. Cl.³ C10J *3/50*

U.S. Cl. 414—217 14 Claims

1. A method of continuously feeding finely divided solids to a vessel containing first gas, comprising the steps of:

(a) feeding finely divided solids into a rotor rotatably arranged in the vessel;

(b) rotating said rotor so that the solids are discharged therefrom into the vessel; and

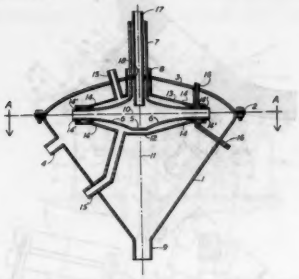
(c) surrounding at least a portion of the rotor with a layer of

a second gas having a lower density than the first gas present in said vessel and maintaining said second gas separate from said first gas.

7. An apparatus for the feeding of finely divided solids to a gas-containing vessel comprising:

(a) a rotor rotatably arranged in the vessel;

(b) a feed inlet to said rotor for introducing finely divided solids into said rotor;



(c) said rotor having means for discharging the finely divided solids therefrom into the vessel; and

(d) a shield surrounding at least a portion of said rotor and forming a virtually gas-tight sealed space between the rotor and a first gas present in the vessel for receiving and maintaining a second gas therein separate from the first gas in the vessel.

4,360,307

DEVICE FOR VERTICAL AND/OR HORIZONTAL TRANSPORT OF LOADS INTO AND OUT OF A VEHICLE OR THE LIKE

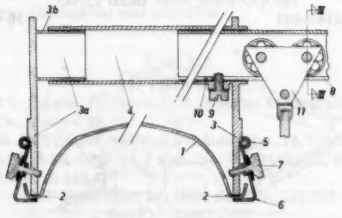
Ralf Larsson, Mölndal, Sweden, assignor to Ide-Produktion Ralf Larsson, Mölndal, Sweden

Filed Oct. 14, 1980, Ser. No. 196,362

Claims priority, application Sweden, Oct. 18, 1979, 7908643

Int. Cl.³ B60P *1/02*

U.S. Cl. 414—542 **6 Claims**



1. A device for transporting loads horizontally and vertically into and out of a vehicle or the like of the type comprising a tubular supporting member attached to said vehicle roof and extending laterally thereof, and a lifting device connected to said supporting member and arranged for principally effecting vertical transport, the improvement comprising:

means for spacing said supporting member above said vehicle roof;

said supporting member housing a supporting arm which is displaceable along said supporting member, said supporting member including means for telescopingly moving said supporting arm between a position entirely inside said vehicle to positions outside said vehicle; and

said lifting device being suspended from said supporting arm by connecting members having their length vertically adjustable, whereby said lifting device can be moved between an inactive position wherein said lifting device is located between the vehicle roof and the supporting member, and an active position wherein the lifting device is level with the door opening of the vehicle.

6. A device for transporting loads horizontally and vertically into and out of a vehicle or the like of the type comprising a tubular supporting member attached to said vehicle roof and extending laterally thereof, and a lifting device connected to said supporting member and arranged for principally effecting vertical transport, the improvement comprising:

means for attaching said supporting member below said vehicle roof;

said supporting member housing a supporting arm which is displaceable along said supporting member, said supporting member includes means for telescopingly moving said supporting arm between a position entirely inside said vehicle to positions outside said vehicle, said supporting member further being provided with supporting wheels and being carried by track members attached to the inner side of the vehicle roof, said tracks extending in the longitudinal direction of the vehicle, whereby the supporting member can be transferred in a longitudinal direction, e.g., between front and rear seats, when the supporting arm has been moved to an inner position inside the vehicle; and

said lifting device being suspended from said supporting arm by connecting members.

4,360,308

POSITIONAL CONTROL DEVICE

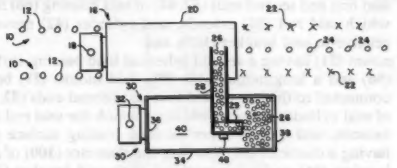
John F. Gifford, 165 Farm Rd., Woodside, Calif. 94062; Edward Sliger, 5589 Starcrest Dr., San Jose, Calif. 95123, and Joaquin Leal, 1236 Reed Rd., Yuba, Calif. 95991

Continuation of Ser. No. 955,611, Oct. 30, 1978, abandoned.

This application Nov. 28, 1980, Ser. No. 211,230

Int. Cl.³ B65G *67/08*

U.S. Cl. 414—572 **22 Claims**



17. A control system for positioning an object with respect to a first surface as a function of its distance from a second surface, comprising:

first measurement means for determining a first distance, wherein the first distance is the distance between said object and said surface;

comparison means for comparing said first distance with a predetermined reference distance and providing an output which is a function of the difference between the first distance and the predetermined reference distance;

positioning means for causing the position of the object to be altered whenever the output of the comparison means exceeds predetermined limits to thereby maintain said first distance within a predetermined range;

second measurement means for determining a second distance, wherein the second distance is the distance between the object and a second surface, wherein said second surface intersects the first surface and has an edge spaced from the first surface; and

modification means coupled to the second measurement means and the comparison means, for increasing the value of the predetermined reference distance when the measured second distance falls below a first set value, thereby

causing the object to be moved closer to the edge of the second surface as the second distance decreases.

4,360,309

HYDRAULIC CYLINDER WITH SPHERICAL BEARING MOUNT

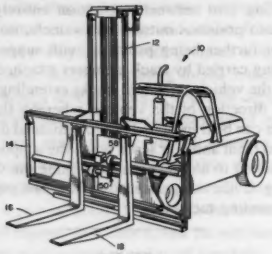
Jerry L. Reeves, Dallas, Oreg., assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US80/00129, § 371 Date Feb. 7, 1980, § 102(e) Date Feb. 7, 1980, PCT Pub. No. WO81/02290, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 7, 1980, Ser. No. 138,040

Int. Cl.³ B66F *9/00*

U.S. Cl. 414—671 **4 Claims**



1. In a mounting assembly **(50)** for a hydraulic cylinder **(42)** having a cylindrical, housing **(66)** and a rod **(54)**, said housing **(66)** having first and second ends **(52, 64)**, a longitudinal axis **(81)** and a predetermined outer diameter **(100)**, and said rod **(54)** being positioned to extend from one of said first and second ends **(52, 64)** of said housing **(66)**, the improvement comprising:

a bracket **(102)** having a first spherical load bearing surface **(106)** and being positioned at a location adjacent the one of said first and second ends **(52, 64)** of said housing **(66)** from which said rod **(54)** extends, said cylinder **(42)** movable relative to said bracket **(102)**; and

a mount **(51)** having a second spherical load bearing surface **(96)** and a longitudinal axis **(80)**, said mount **(51)** being connected to the one of said first and second ends **(52, 64)** of said cylinder housing **(66)** from which the said rod **(54)** extends, said second spherical load bearing surface **(96)** having a diameter **(98)** less than the diameter **(100)** of said housing **(66)** and being engaged with said bracket **(102)** with said first and second spherical load bearing surfaces **(106, 96)** in contact with one another, and said longitudinal axis **(80)** being in line with axis **(81)**, said mount **(51)** having a housing endcap **(62)**, said second spherical load bearing surface **(96)** being connected to said endcap **(62)** and extending from said endcap **(62)** to a location spaced from the one of the said first and second ends **(52, 64)**, said endcap **(62)** and said second spherical load bearing surface **(96)** having a bore **(88)**, said rod **(54)** being positioned to extend through the bore **(88)**.

4,360,310

ARRANGEMENT FOR POSITIONING A DEVICE FOR CLOSING AND OPENING PRESSURE VESSELS

Friedrich-Wilhelm Kost, Bochum, Fed. Rep. of Germany, assignor to Kloeckner-Werke AG, Duisburg, Fed. Rep. of Germany

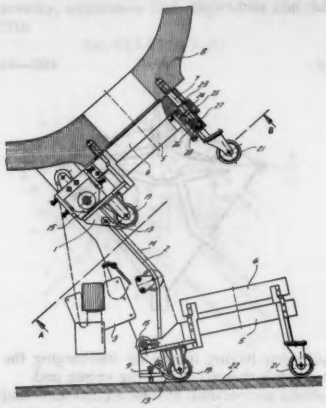
Filed Jun. 3, 1980, Ser. No. 156,212

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1979, 7916956[U]

Int. Cl.³ C10B *25/14*

U.S. Cl. 414—684.3 **9 Claims**

1. An arrangement for positioning a device for closing and opening a pressure vessel with use of screws, such as a steam generator by screwing the device to and unscrewing the device from the pressure vessel, the arrangement comprising a positioning vehicle arranged to carry the device; and a positioning track attachable to the pressure vessel and extending from just above a floor under the pressure vessel to the pressure vessel, said positioning track being arranged to guide said positioning vehicle so that the latter can be displaced from the floor to the pressure vessel so as to bring the device to and to close the pressure vessel, and from the pressure vessel to the floor so as to open the pressure vessel, with the guidance over said positioning track.



4,360,311

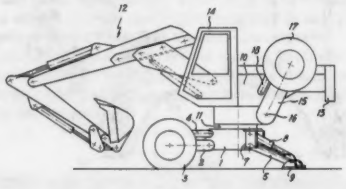
PUBLIC WORKS MACHINE, SUCH AS A HYDRAULIC SELF-PROPELLED ARTICULATED SHOVEL

Serge Dufour, Rue du Clos Joli, F01300 Belley, France

Filed Oct. 22, 1979, Ser. No. 189,842

Int. Cl.³ E02F *9/08*; B62D *25/00*

U.S. Cl. 414—687 **10 Claims**



1. Public works machine such as a self-propelled hydraulic shovel, characterized in that it comprises, in combination, a lower chassis **(1)** provided with two carrying wheels **(3)** and stabilizers **(5)** that may be raised or lowered, and a superstructure **(10)** carrying a working device **(12)** and rotatably mounted on the lower chassis **(1)** for rotation relative to the lower chassis about an upright axis, a pair of carrying wheels **(17)** being disposed on this superstructure, means **(15, 18)** being provided to displace this pair of carrying wheels between a position in which they bear on the ground and an elevated position, whereby the chassis may bear on the ground selectively by the first-mentioned wheels and said stabilizers or by said first-mentioned wheels and the wheels disposed on the superstructure.

4,360,312

SCRAP REMOVAL APPARATUS

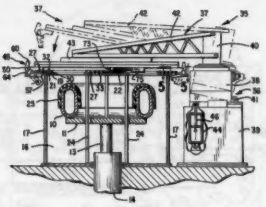
Ronald L. Satzler, Princeville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00781, § 371 Date Jun. 23, 1980, § 102(e) Date Jun. 23, 1980, PCT Pub. No. WO82/00027, PCT Pub. Date Jan. 7, 1982

PCT Filed Jun. 23, 1980, Ser. No. 250,750

Int. Cl.³ B65H *29/08*

U.S. Cl. 414—741 **9 Claims**



1. In a device having a table (19) upon which scrap (32,33) to be removed lies, a scrap removal apparatus (35) comprising:

a lift arm assembly (37);

means (36) for supporting said lift arm assembly (37) and elevating and moving said lift arm assembly (37) between a first position adjacent and above the table (19) and at least one other position away from the table (19) where said scrap (32,33) may be deposited;

a plurality of clamps (50) carried by said lift arm assembly (37) adapted to grip a portion of the scrap (32), a table (19) having slots (70) defined at the edges thereof which the scrap (32) overlies and through which the clamps (50) are partially movable;

remotely actuable power means (60) for closing and opening said clamps (50) for gripping and releasing said scrap (32);

a blade (80) and a stop (73) are carried by said lift arm assembly (37); and

a remotely actuable power means (75) is provided for moving said blade (80) toward and away from said stop (73), said blade (80) being moved toward said stop (73) to gather another portion of the scrap (33) and to hold said scrap (33) against said stop (73).

4,360,313

LIFT FIXTURE

Ronald L. Satzler, Princeville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00320, § 371 Date Mar. 24, 1980, § 102(e) Date Mar. 24, 1980, PCT Pub. No. WO81/02722, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 24, 1980, Ser. No. 211,533

Int. Cl.³ B65G *7/00*

U.S. Cl. 414—781 **9 Claims**

1. A lift fixture (10) for holding and centering a workpiece (93) comprising:

a yoke (17) having arms (22,23) on either side of the longitudinal axis of the yoke and adapted to be positioned about the workpiece (93);

a clamp (20) mounted between the yoke arms (22,23);

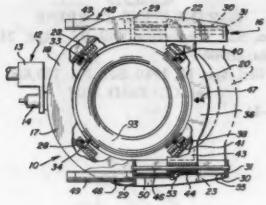
means (48) for driving said clamp (20) between an open position and a closed position adjacent the workpiece (93);

a plurality of angularly spaced holding mechanisms (33,34,40,41) adapted to grip the workpiece (93), a portion of said holding mechanisms being carried by said yoke (17) and a portion being carried by said clamp (20);

means (57) for movably mounting each of said holding mechanisms (33,34,40,41) to one of said yoke (17) and clamp (20) to permit motion of said holding mechanisms (33,34,40,41) relative to said yoke (17) and clamp (20) along lines generally tangential to said workpiece (93);

said mounting means (57) includes a rod (84) for each of said holding mechanisms (33,34,40,41) fixed to one of said yoke (17) and clamp (20)

means (87,88) for biasing each of said holding mechanisms (33,34,40,41) to a preselected centered position relative to its respective mounting means (57), whereby gripping and



lifting of the workpiece (93) by the holding mechanisms (33,34,40,41) permits said biasing means (87,88) to equalize the forces acting between said holding mechanisms (33,34,40,41) through the workpiece (93) thereby centering the workpiece (93) within the lift fixture (10); and

means (81) on each of said holding mechanisms (33,34,40,41) for engaging said rod (84) and permitting linear movement of said holding mechanisms (33,34,40,41) therealong.

4,360,314

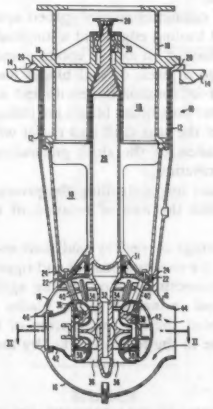
LIQUID METAL PUMP

William E. Pennell, Greensburg, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 10, 1980, Ser. No. 128,986

Int. Cl.³ F04D *29/44*

U.S. Cl. 415—219 A **7 Claims**



1. A liquid metal pump comprising:

a housing having a generally spherical lower section;

pump internals disposed in said housing and supported solely by attachment to said housing near the top thereof;

a pump shaft rotatably disposed in said pump internals;

a double sided impeller attached to said pump shaft for circulating a liquid metal;

an impeller cage supported from said pump internals and disposed around said impeller; and

a high pressure toroidial diffuser assembly attached to said

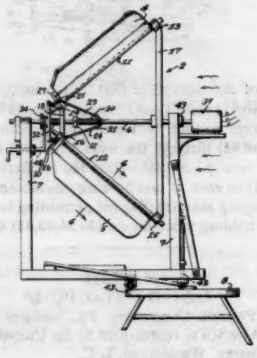
spherical lower section of said housing with substantially all sections of said diffuser assembly being directly exposed to said liquid metal and being slidably disposed around but not attached to said impeller cage for conducting said liquid metal, said liquid metal pump providing axisymmetric distribution of said liquid metal in said pump and providing removability of said pump internals, pump shaft, impeller, and impeller cage as a unit.

4,360,315

VORTEX WIND TURBINE

Leonard Olson, 925 Tenderfoot Hill Rd., Apt. 216, Colorado Springs, Colo. 80906

Filed Apr. 14, 1980, Ser. No. 139,800
Int. Cl.³ F03D 7/04
U.S. Cl. 416—41 **2 Claims**



1. A wind turbine comprising:

a rotatable horizontally disposed power output shaft;

turn-table means pivotally supporting the shaft around a vertical axis;

a plurality of circumferentially spaced apart blades having leading and trailing edges and a longitudinal center line;

hinge means having an axis of rotation and attached to the leading edge of each of said blades and carried by the power shaft for rotation therewith and wherein the longitudinal center lines of the blades are oblique to the longitudinal axis of the said shaft and radial with respect to the axis of rotation of the shaft generating a cone-shaped surface on rotation;

governor means for controlling the pivotal position of the blades around the axis of rotation of the hinge means including:

a pair of springs carried by said shaft and arranged to be disposed for exerting coaxial and opposite forces; and

movable connecting means bearing against each of said springs and connected to the blades for pivoting the blades about the axis of rotation of the hinge means responsive to the forces exerted by the said springs.

4,360,316

TWO CYCLE PER REVOLUTION WAVE COMPRESSION SUPERCHARGER

Christian J. Rahnke, Orchard Lake, Mich., assignor to Ford Motor Company, Dearborn, Mich.

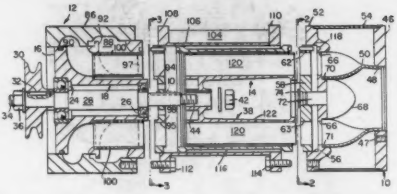
Filed Jul. 7, 1980, Ser. No. 166,730
Int. Cl.³ F04F 11/00
U.S. Cl. 417—64 **5 Claims**

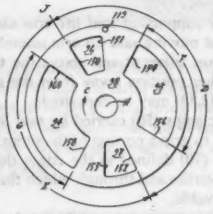
1. A two cycle compression wave supercharger for compressing air supplied to an engine comprising:

a rotor mounted for rotation about an axis having vanes extending radially therefrom and distributed circumferentially about the axis, the vanes defining rotor cells therebetween that extend along the axis;

an exhaust gas port plate located at a first axial end of the rotor having two inlet gas ports through which exhaust gas from the engine enters the rotor cells and two outlet gas ports through which exhaust gas exists the rotor cells, the inlet and outlet gas ports being located alternately around the axis and grouped in pairs, each pair associated with one compression cycle, the angles subtended by each pair being equal;

an air port plate located at the axially opposite end of the





rotor having two air inlet ports through which air at low pressure enters the rotor cells and two air outlet ports through which compressed air exits the rotor cells, the inlet and outlet air ports being located alternately around the axis and grouped in pairs, each pair cooperating with a gas port pair for operation at one optimum rotor speed, the angle subtended by a first air port pair being different from the angle subtended by the second air port pair, the angular dimension of the air inlet ports of the first and second pairs being different one from another, the angular dimension of the air outlet ports of the first and second pairs being different one from another.

4,360,317

THREE CYCLE PER REVOLUTION WAVE COMPRESSION SUPERCHARGER

James K. Vallance, Northville, and Christian J. Rahnke, Orchard Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 1, 1980, Ser. No. 174,320
Int. Cl.³ F04F 11/00
U.S. Cl. 417—64 **3 Claims**

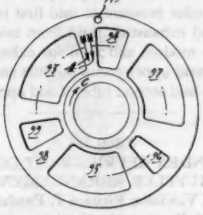
1. A three cycle compression wave supercharger for compressing air supplied to an engine comprising:

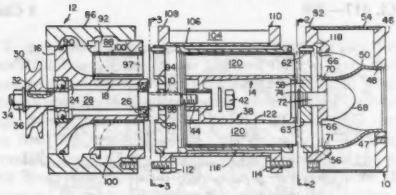
a rotor mounted for rotation about an axis having vanes extending radially therefrom and distributed circumferentially about the axis, the vanes defining rotor cells therebetween that extend along the axis;

an exhaust gas port plate located at a first axial end of the rotor having three inlet gas ports through which exhaust gas from the engine enters the rotor cells and three outlet gas ports through which exhaust gas exists the rotor cells, the inlet and outlet gas ports being located alternately around the axis forming pairs that include one inlet and

one outlet gas port, each pair associated with one compression cycle, the angles subtended by each pair being equal;

an air port plate located at the axially opposite end of the rotor from that of the first end having three air inlet ports through which air at low pressure enters the rotor cells and three air outlet ports through which compressed air exits the rotor cells, the inlet and outlet air ports being located alternately around the axis forming pairs that





include one inlet and one outlet air port, each pair associated with one compression cycle, the angle subtended by a first air port pair being different from the angle subtended by the second and third air port pairs, the angular dimension of the openings of the air inlet ports of the first, second and third pairs being different one from another, the angular dimension of the openings of the air outlet ports of the first, second and third pairs being different one from another.

4,360,318

GAS COMPRESSOR OF THE ROTATING TYPE

Andres A. Corvetto, Lavalle 1977, 1° C, Buenos Aires, Argentina

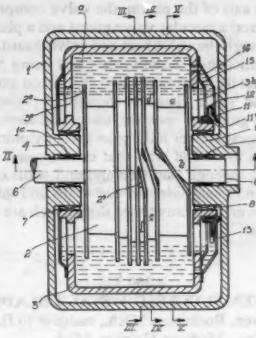
Filed May 8, 1980, Ser. No. 149,134

Claims priority, application Argentina, Jul. 11, 1979, 277252

Int. Cl.³ F04C *19/00*

U.S. Cl. 417—68 **12 Claims**

1. A rotary gas compressor, comprising a hollow housing; a hollow inner rotor arranged in said housing and rotatable about an axis, said inner rotor having two axial ends, a central region between said axial ends, and an the exterior and interior of said inner rotor, said inner rotor having two outer blades which are formed substantially as oppositely wound helices and each extend from a respective one of said axial ends to said central region and thereby to said opening, so that gas enters each of said blades at a respective one of said axial ends, travels along each of said blades, and exits the latter into the interior of said inner rotor through said opening; a hollow outer rotor arranged in said housing and eccentrically surrounding said inner rotor with the interposition of a liquid ring, so that said outer rotor rotates in response to the rotation of said inner rotor via said liquid ring; liquid ring level controlling means having a member which freely rotates over said outer rotor and includes acceleration and deceleration tubes, said acceleration tube being arranged to receive an incoming fluid and to introduce the same into said liquid ring, whereas said decelerating tube is arranged to receive the fluid outgoing from said liquid ring and to pass the same into the interior of the housing;



means for separating microdrops contained in said fluid, in the interior of said inner rotor; and means for loading and unloading the compressor by varying the position of said liquid ring.

4,360,319

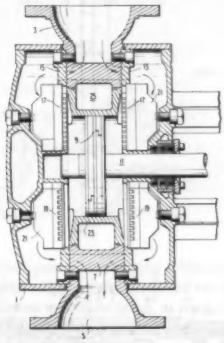
COMPRESSOR

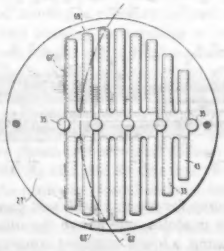
Win Paget, P.O. Box 1335, Elizabethtown, N.C. 28337

Filed Aug. 13, 1980, Ser. No. 177,609

Int. Cl.³ F04B *21/04, 39/10*; F16K *15/14*

U.S. Cl. 417—238 **11 Claims**





8. A compressor having a cylinder, a cylinder head closing one end of the cylinder, a piston secured to a piston rod and reciprocable in the cylinder toward and away from the cylinder head, a valve in the cylinder head, the valve being circular

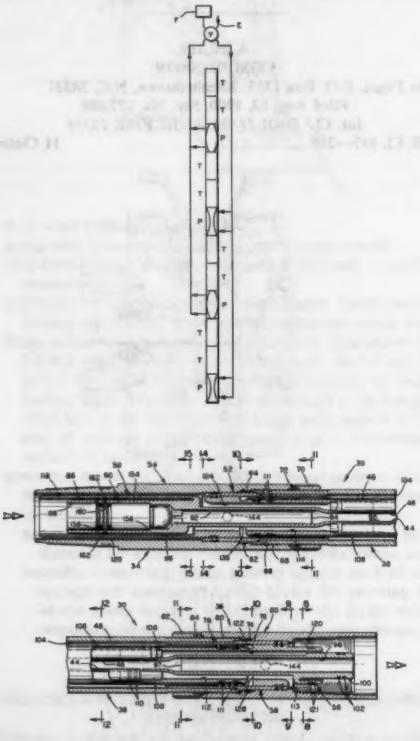
and disposed in a plane perpendicular to the piston rod and having its axis spaced from and parallel to the axis of the piston, the valve extending radially outwardly beyond the piston relative to the axis of the piston, the valve comprising a circular valve seat and a circular valve guard and a plurality of slots extending through the valve seat and valve guard and disposed in parallel relationship to each other and being perpendicular to the plane that includes said valve and piston axes and bisects said valve, and valve elements movable between said valve seat and valve guard to open and close said slots, the cylinder having a replaceable liner having an inner cylindrical side wall that terminates in an end wall that contacts said valve, and a port extending through said side and end walls of the liner at the intersection of said side and end walls and said plane, said port directly overlying only those slots which are farthest from said piston axis.

4,360,320

FLUID DRIVEN SUCCESSIVE STAGE BLADDER PUMP

Douglas B. Owen, Rochester, Mich., assignor to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Filed Aug. 4, 1980, Ser. No. 175,281
Int. Cl.³ F04B *43/10, 35/02*
U.S. Cl. 417—244 **12 Claims**



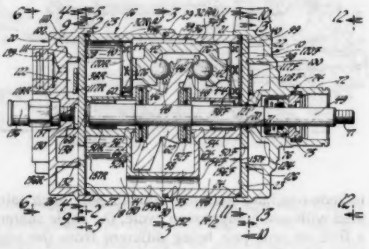
1. A liquid pump for use in a well, said pump comprising at least two pump modules, one above the other, each module including a housing, a lower coupling connected to said housing and an upper coupling connected to said housing, a first tube extending between said lower coupling and said upper coupling and forming a passage therebetween, a second tube extending between said lower coupling and said upper coupling and forming a passage therebetween, a flexible tubular member positioned around both of said tubes and extending between said lower coupling and said upper coupling, and means connecting said first tube with space on one side of said flexible member, passage means in said lower coupling for supplying liquid to the space on the other side of said flexible member, and passage means in said upper coupling for receiving liquid from said space on the other side of said flexible member, one of said tubes of said upper pump module communicating with said second tube of said lower pump module, the other of said tubes of said upper pump module communicating with said first tube of said lower pump module, and means for supplying fluid under pressure to said first tube of said upper pump module and exhausting fluid from said second tube of said upper pump module and then for exhausting fluid from said first tube of said upper pump module and supplying fluid under pressure to said second tube of said upper pump module.

4,360,321

MULTICYLINDER REFRIGERANT COMPRESSOR MUFFLER ARRANGEMENT

Carl A. Copp, Jr., Vandalia; Richard T. Pandzik, and Marvin E. Gaines, both of Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1980, Ser. No. 151,682
Int. Cl.³ F04B *1/16, 1/18*
U.S. Cl. 417—269 **1 Claim**

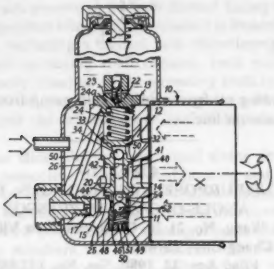


1. In a multicylinder refrigerant compressor of the type having double-ended pistons operating in aligned cylinder bores of a transversely split two-piece cylinder block to discharge refrigerant from the opposite ends thereof to discharge chambers formed in opposite ends of the compressor: an improved muffler arrangement completely formed within the compressor comprising a separate attenuation chamber ported at one of two opposing ends thereof directly to each discharge chamber and employed to facilitate processing of a plurality of steps in the manufacture of each cylinder block, each said attenuation chamber being formed within and as an integral part of the cylinder block between two adjacent cylinder walls thereof, an attenuation passage directly connecting said attenuation chambers at their other end, said attenuation passage also being formed in and as an integral part of the cylinder block and extending from between said two adjacent cylinder walls, the volumes of said attenuation chambers being substantially equal and the length of said attenuation passage being substantially longer than the corresponding longitudinal dimension of said attenuation chambers so as to attenuate the refrigerant discharge pulses admited to the discharge chambers to an acceptable output level totally within the structure of the compressor, and said attenuation passage being formed by a longitudinal bore in each cylinder block piece that is also adapted to serve as a location means which is employed to perform a plurality of manufacturing steps including the processing of the cylinder bores and other details of each cylinder block piece that require accurate alignment with their counterpart(s) in any other cylinder block piece to thereby permit their processing as separate pieces rather than simultaneously as a married pair.

4,360,322
POSITIVE DISPLACEMENT PUMP SYSTEMS

Ian T. Bristow, Higham, and Nigel J. Petts, Rochester, both of England, assignors to Hobourn-Eaton Limited, Rochester, England

Filed Dec. 10, 1979, Ser. No. 101,788
Claims priority, application United Kingdom, Dec. 13, 1978, 48268/78; Dec. 13, 1978, 48269/78
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—300 **8 Claims**



1. A positive displacement pump system having first and second delivery passages for pumped fluid, a main discharge passage which incorporates a discharge orifice and which is in permanently open communication with the first delivery passage, a valve controlling the supply of fluid from the second to the first delivery passage and the quantity of fluid supplied from the first delivery passage to the main discharge passage and comprising a valve bore and a valve member slidably mounted in the valve bore, overspill porting opening to the valve bore, said valve member having applied to it a force derived from the pressure drop across the discharge orifice and operating in response to an increase of said pressure drop above a predetermined value to move the valve member to cause fluid from the first and second delivery passages to be by-passed through the overspill porting, and means for superimposing on the valve member an additional force which is derived from the delivery pressure in one of said delivery passages and which operates in the same sense as the first said force.

4,360,323
PROPORTIONING PUMPING SYSTEM FOR DIALYSIS MACHINES

Robert L. Anderson, Boulder, Colo., assignor to Halbert Fischel, Los Angeles, Calif.

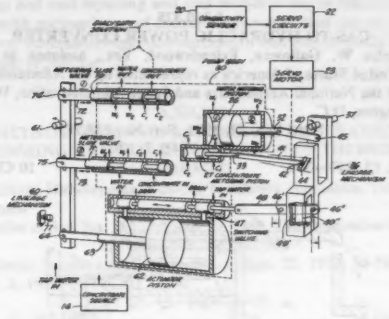
Filed Nov. 19, 1976, Ser. No. 743,224
Int. Cl.³ F04D *17/00, 23/06*
U.S. Cl. 417—349 **13 Claims**

1. A positive displacement system for delivery of two liquids at controlled rates using at least one pressurized liquid comprising:

first and second reciprocating piston means including first pivotally mounted linkage means coupled to reciprocate said piston means in synchronism, each for pumping a different liquid;

metering valve means including conduit means for controlling liquid flow directions through said piston means in response to the position of said metering valve means;

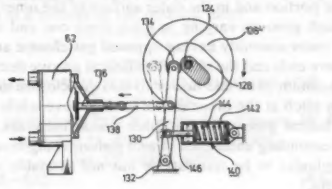
and control means including reciprocable actuator piston means, and switching valve means, and second pivotally mounted linkage means coupling said actuator piston means to reciprocate the metering valve means, said switching valve means being coupled to said first and second piston means and responsive to the position of said first and second piston means, said switching valve means being coupled to shift between limit positions synchronously with direction changes of said first and second piston means and controlling liquid flow to said actuator piston to shift said piston between limit positions synchronously with selected positions of said first and second piston means and reciprocate more rapidly than said first and second piston means.



4,360,324
PULSATILE BLOOD PUMP

Shozo Ohara, and Toshio Ichinose, both of Tokyo, Japan, assignors to Nikkiso, Co. Ltd., Japan

Continuation-in-part of Ser. No. 773,602, Mar. 2, 1977, abandoned. This application Feb. 25, 1980, Ser. No. 123,960
Claims priority, application Japan, Nov. 9, 1976, 51-133785
Int. Cl.³ F04B *35/02*
U.S. Cl. 417—388 **4 Claims**



1. A pulsatile blood pump comprising a hermetically sealed housing, a disposable, substantially enclosed sac of anticoagulative material mounted in said housing, at least one portion of said sac being formed of highly flexible material, said sac being provided with a suction port having an inlet check valve and a delivery port having an outlet check valve to constitute a closed pump unit, said suction and delivery ports extending outwardly of said housing, a pressure transmissive fluid means located within said housing surrounding at least in part said highly flexible wall of said sac and drive means for generating a pulsatile pressure in said transmissive fluid to flex said highly flexible wall producing a pumping action in said sac having a delivery stroke and a suction stroke, said drive means comprising a cam mechanism including a disc rotatable about a central axis by said drive means and provided with an eccentric channel means for rotating said disc about a central axis, and means for converting the rotary motion of said disc into reciprocating motion comprising a follower member, a stroke control means connected to said follower member, a connecting rod and a piston communicating with said transmissive fluid, and torque reduction means adapted to render said suction and delivery stroke uniform, said torque reduction means including a rocking lever on which said follower member is mounted pivoted at one end to a fixed base member and engaging at its opposite end the eccentric channel and a resilient plunger fixedly se-

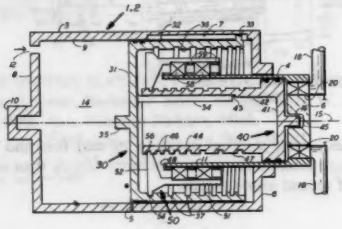
cured within a cylinder having a connecting rod attached to said rocking lever.

4,360,325

GAS-TO-HYDRAULIC POWER CONVERTER

Charles W. Galloway, Friendswood, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 27, 1981, Ser. No. 238,785
Int. Cl.³ F04B *9/10*
U.S. Cl. 417—399 **10 Claims**



2. A gas-to-hydraulic power converter comprising an outer piston and cylinder assembly, an inner piston and cylinder assembly disposed within and coaxial with said outer assembly, and a motion transfer ring rotatably but not translatably mounted between the two assemblies and having opposed antifriction bearing surface portions engaging helical grooves in the sidewalls of the two pistons, in the inner surface of the outer portion and in the outer surface of the inner piston, each of such grooves varying in pitch from one end to the other, said outer assembly having opposed gas closure and hydraulic closure ends and the pitch of its helical groove decreasing from a maximum at its end nearer to said gas closure end to a minimum pitch at the other end of such groove while the pitch of the helical groove of the inner piston increases between its corresponding ends, each of said pistons being mounted within its cylinder to be translatable but not rotatable with respect thereto.

4,360,326

OIL LUBRICATED VACUUM PUMP INCLUDING AN OIL SEPARATOR DISPOSED ADJACENT OF ITS SUCTION OPENING

Peter Buchholz, and Rolf Warnecke, both of Gifhorn, Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

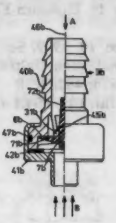
Filed Jan. 31, 1980, Ser. No. 117,290
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904686
Int. Cl.³ F04C *27/02, 29/02*
U.S. Cl. 418—97 **5 Claims**

1. In combination with an oil lubricated vacuum pump having a suction opening, an oil separator comprising:

a hollow housing having a longitudinal axis and a first end disposed adjacent said suction opening, said housing further having a second end for attachment to a vacuum line;

a valve seat surrounding the longitudinal axis of said housing and comprising a surface thereof; and

a naturally resilient elastic sealing element having a relatively low mass positioned under tension on said valve seat between said valve seat and said suction opening, the tension on said sealing element being caused solely by the natural resiliency of said sealing element as it engages said valve seat, said sealing element permitting a stream of air from said vacuum line to enter said suction opening while



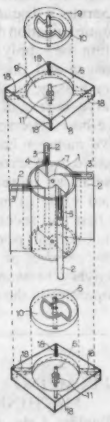
preventing oil from said vacuum pump from passing into said vacuum line.

4,360,327

MULTIPURPOSE, SYNCHRONOUS, THREE ANGLE-CROSS COMPRESSOR

Liang-Chih Wang, No. 21-20, Chungchin New Village, Tienhsin St., San Chung City, Taiwan

Filed Apr. 23, 1980, Ser. No. 142,885
Int. Cl.³ F04C *18/00, 29/00*
U.S. Cl. 418—235 **3 Claims**



1. A multipurpose, synchronous, three angle-cross compressor which comprises

two spaced apart, flat end plates, each said end plate including a blind cylindrical bore which extends from its outer side which is opposite the side facing the other end plate towards its inner side, each end plate also including a hole which extends from the center point at the bottom of the blind cylindrical bore therein to its inner side, as well as at least four slots which extend in non-radial fashion away from the wall of the blind cylindrical bore, each slot including a connector portion which extends through to the inner side of the respective end plate, and all the slots in each end plate being equally spaced from one another,

a generally cylindrical housing which extends between the two spaced apart, flat end plates, said housing including a hollow cylindrical body and at least four flanges which extend outwardly of the body in a non-radial fashion, the number and orientation of the flanges corresponding with the number and orientation of the slots in said end plates, each flange including a slideway which communicates with the interior of the hollow cylindrical body,

an elongated S-shaped wing shaft located within the hollow cylindrical body of said housing so as to be rotatable therein, said S-shaped wing shaft including a central bore therethrough,

a mounting shaft which extends through the central bore in said S-shaped wing shaft and through the support holes in said end plates, said mounting shaft being fixedly connected to said S-shaped wing shaft and of sufficient length to extend beyond the outer sides of said two end plates,

two disc cams, each said disc cam being dimensioned to rotatably fit within the blind cylindrical bore in a respective said end plate, each said disc cam including an S-shaped track groove in the side thereof facing the bottom of the respective blind bore in which it is located, and each disc cam including a central hole therethrough through which said mounting shaft extends, each said disc cam being fixedly attached to the mounting shaft such that the orientation of the S-shaped track groove therein corresponds with the orientation of said S-shaped wing shaft, and

at least four slider devices, each said slider device fitting within a respective flange of said housing and movable in and out of the interior of the hollow cylindrical body based on the degree of rotation of said disc cams, each said slider device comprising a rectangular member and two extension members, the two extension members comprising first arm portions which extend away from corresponding ends of the opposite short sides of the rectangular member, second arm portions which extend towards the opposite ends of the short sides of the rectangular member and in parallel with the short sides of the rectangular member, and third arm portions which extend away from the opposite ends of the short sides of the rectangular member, the first arm portions of each extension member fitting within a respective connector portion of a slot in the respective end plate and the third arm portions of each extension member fitting with a respective S-shaped track groove in a respective disc cam,

and wherein the cylindrical body of said generally cylindrical housing includes two sets of compressed air inlet openings and two sets of air outlet openings.

4,360,328

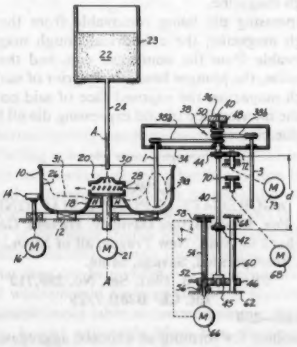
COTTON CANDY MANUFACTURING APPARATUS

Levon Kassabian, 1375 Riviera Dr., Pasadena, Calif. 91107

Filed Jun. 15, 1981, Ser. No. 273,672

Int. Cl. A23G *3/12*; B29F *3/06*

U.S. Cl. 425—9 **24 Claims**



1. Apparatus for making cotton candy, comprising: a dish-shaped pan having an open end, means adapted to form in situ in said dish-shaped pan a generally annular mass of cotton candy circumscribed by said pan, spindle means for winding a portion of said cotton candy mass on itself and about said spindle for separation of said portion from a remainder of said mass, spindle carrying means for injecting said spindle into said open end of said pan and into said mass of cotton candy and withdrawing said spindle from said mass of cotton candy and said open end, and timing means for controlling said carrying means and said injecting and said withdrawing in timed relation with accumulation of cotton candy within said pan so as to recover successive separated portions of said cotton candy as it is made in said pan.

4,360,329

METHOD OF MANUFACTURING A DECORATED FORMING ARTICLE AND THE ARTICLE THEREBY FORMED

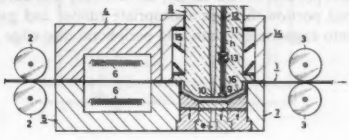
Yoshiharu Hatakeyama, 5-29-10, Tachibana, Sumidaku, Tokyo, Japan

Division of Ser. No. 112,726, Jan. 17, 1980. This application Oct. 15, 1981, Ser. No. 311,903

Claims priority, application Japan, Jun. 20, 1979, 54-76885; Dec. 3, 1979, 54-166103

Int. Cl.³ B29C *6/00*

U.S. Cl. 425—112 **4 Claims**



1. In a metal mold consisting of an injection mold and a pouring mold, said metal mold comprises inserting a pin into a pin hole ascendably and descendably together with providing a pin hole from which the hot wind can be sprayed out there through into an injection mold, and providing a hole or groove for vacuum at a bottom of the pouring mold.

4,360,330

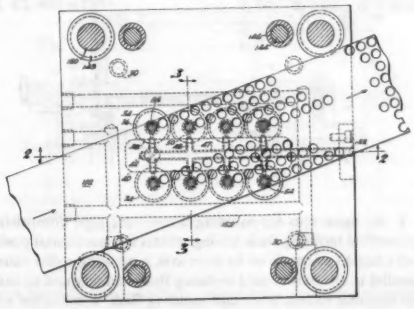
DEVICE FOR MOLDING FLASH CAPS FOR CATHETERS

Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134

Filed Jul. 13, 1981, Ser. No. 282,414

Int. Cl.³ B29C *6/00*

U.S. Cl. 425—122 **26 Claims**



1. A device fo molding flash caps for catheters, for fixed attachment relative to confronting upper and lower faces of respective upper and lower operable jaws of a conventional press, and including conventional indexing means for a strip of a suitable absorbant material to index the strip for a predetermined distance with each operation of the jaws between open and closed positions, said molding device including a top molding portion for fixed attachment to the upper face and a bottom

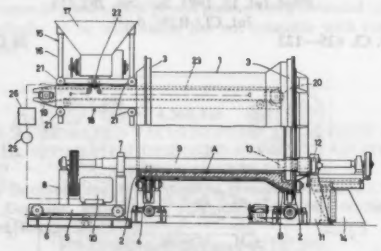
molding portion for fixed attachment to the lower face, in a spaced apart relation to said top portion, in the jaws open position, at least one cavity of a predetermined size and configuration, opening upwardly through a bottom wall of said top portion, a core pin mounted in said bottom portion in axial alignment with said cavity, and normally disposed below said cavity in a retracted position, when the jaws are in the open position, and a punch die mounted in said top portion in axial alignment with said cavity and core pin, and disposed above the strip of material, in a retracted position, in a jaws open position, whereby, operation of the jaws to closed positions moves said top and bottom portions into an abutting relation and extends a tip end portion of said core pin to a predetermined depth inwardly of said cavity, and simultaneously advances said punch die axially inwardly, in an opposed relation to said core pin, to punch a disc shaped portion from the strip and to advance the disc portion inwardly of a top end of said cavity to a position against a tip end face of said core pin, whereby, a peripheral edge portion of the disc is integrally bonded in a top end of a flash cap as formed in said cavity, when a suitable molten plastic material is injected into a peripheral portion of said cavity, surrounding said core pin leading end portion through appropriate runner and gate means, and into engagement with said peripheral disc edge portion.

4,360,331

APPARATUS FOR MOLDING A CONCRETE PIPE

Kunizo Hiraoka, Tokyo, Japan, assignor to Hiraoka Giken Kogyo Co., Ltd., Saitama, Japan

Division of Ser. No. 159,923, Jun. 16, 1980, Pat. No. 4,311,632. This application May 8, 1981, Ser. No. 262,028
Int. Cl.³ B28B *21/24*
U.S. Cl. 425—145 **3 Claims**



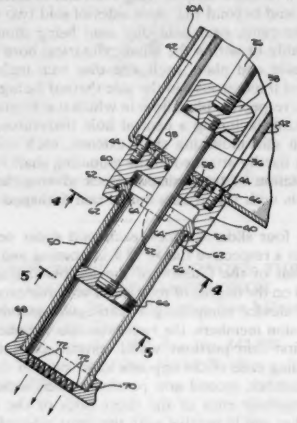
1. An apparatus for molding a concrete pipe comprising a cylindrical molding flask having its axis in a horizontal position and adapted to rotate on its own axis, a pressing roller running parallel to the axis of said molding flask and adapted to axially get into and retreat from said molding flask, a motor for rotating said pressing roller, a power circuit for said motor, a belt conveyor running parallel to the axis of said molding flask and adapted to longitudinally move in said molding flask within the range between both ends of said molding flask, means for delivering fresh concrete at a fixed flow rate to said belt conveyor, and means for causing intermittent longitudinal movement of said belt conveyor at a fixed traveling distance in response to a prescribed degree of compactedness of concrete attained in each position where said belt conveyor stops.

4,360,332

NOODLE MACHINE

Maxwell U. D. Cyin, 352 W. Lomita, Apt. 3, Glendale, Calif. 91204

Filed Oct. 23, 1981, Ser. No. 314,125
Int. Cl.³ A01J *21/00*
U.S. Cl. 425—191 **4 Claims**



1. An easily cleanable noodle expressing machine comprising:

a base having a reservoir and a hydraulic pump,

a downwardly directed ram carried by said base and having a ram cylinder and a piston and piston rod therein,

said piston rod extending from the lower end of said ram cylinder,

a connector cap for a cylindrical dough magazine supported by said base below said ram cylinder,

a cylindrical dough magazine having a upper end detachably connected to said connector,

an expressing die detachably mounted on the lower end of said cylindrical dough magazine,

an axial extension of said piston rod projecting downwardly from the piston rod, through said connector cap and into said cylindrical dough magazine,

a plunger head on said axial extension in said cylindrical dough magazine,

said expressing die being removable from the cylindrical dough magazine, the cylindrical dough magazine being removable from the connector cap, and the piston rod extension, the plunger head, the interior of said cylindrical dough magazine, the exposed face of said connector cap and the interior face of said expressing die all being exposable for cleaning.

4,360,333

AGGREGATE EXPOSING MACHINE

Lonnie G. Fox, Bloomington; David W. Hanson, Golden Valley, and Richard C. Nash, New Prague, all of Minn., assignors to Fabcon, Incorporated, Savage, Minn.

Filed Aug. 3, 1981, Ser. No. 289,713
Int. Cl.³ B28B *1/29*
U.S. Cl. 425—299 **6 Claims**

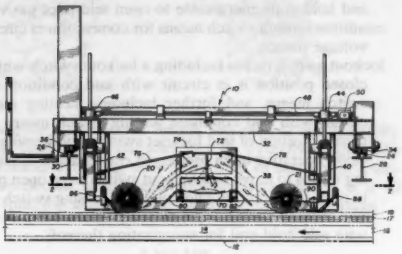
1. A machine for forming an exposed aggregate finish on a cured precast concrete panel, the surface of which has been treated with a retarding agent to retard the curing thereof, said machine comprising, in combination:

a frame;

means for introducing relative motion between said frame and the surface of said panel;

first rotary brushing means mounted on said frame for

rotation about an axis parallel to the surface of said panel and perpendicular to the axis of relative movement between said frame and the panel, said brushing means constructed and arranged to abrade and remove the uncured retarded concrete surface to leave an exposed aggregate surface; and



conveying means mounted on said frame, said conveying means constructed and arranged for receiving uncured concrete material removed from the surface of said plank by said first rotary brushing means and for conveying the concrete away from the concrete panel.

4,360,334

THERMOFORMING MACHINE

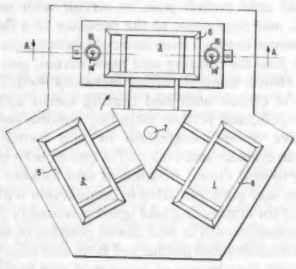
Günther Kiefer, Schwaigern, Fed. Rep. of Germany, assignor to Adolf Illig GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 196,107

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 7927975

Int. Cl.³ B29C *17/04*

U.S. Cl. 425—387.1 **8 Claims**



1. In a thermoforming machine having a plurality of work stations, including at least a charging station for the insertion of a plate of thermoplastic material, a heating station for heating the plate, and a forming station for forming the plate into a desired article, with said stations being arranged in a circle, a like plurality of clamping frames for holding respective plates of thermoplastic material, means for mounting said clamping frames so that they can be pivoted successively from station to station, and wherein said forming station is provided with a height adjustable mold table accommodating a deep drawing mold, and a height adjustable blow box; the improvement comprising means for adjusting the height of said mold table including a pair of hydraulic cylinders arranged symetrically adjacent respective sides of said mold table, with said cylinders being essentially vertical and extending into the interior of said blow box and with each said cylinder and its associated piston rod being connected between a stationary support plate for said mold table and said mold table.

4,360,335

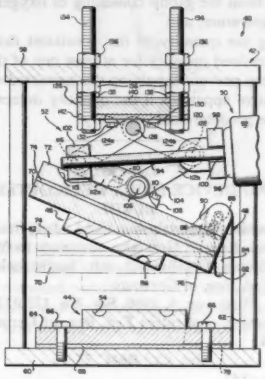
MOLDING PRESS FOR SEMI-PNEUMATIC TIRE BODIES AND THE LIKE

Wilson West, Pulaski, Tenn., assignor to Sun Metal Products, Inc., Warsaw, Ind.

Filed Aug. 28, 1981, Ser. No. 297,230

Int. Cl.³ B29H *5/08*

U.S. Cl. 425—450.1 **10 Claims**



1. A molding press comprising: a machine frame; a stationary platen secured to said machine frame; a movable platen positionable toward and away from said stationary platen for operation through a molding cycle; guide means for directing the path of movement of said movable platen; power providing means; and a scissors mechanism, including a rotatable lead screw connected to said power providing means, a system of pivotally interconnected links fastened to said movable platen and to said machine frame, and a nut fixed in said linkage system and threadedly mounted on said lead screw.

4,360,336

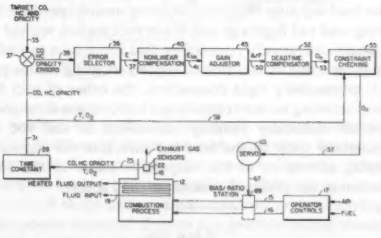
COMBUSTION CONTROL SYSTEM

Stanley H. Shepherd, Milpitas, Calif., assignor to Econics Corporation, Sunnyvale, Calif.

Filed Nov. 3, 1980, Ser. No. 203,035

Int. Cl.³ F23N *3/00*

U.S. Cl. 431—12 **30 Claims**



1. A method of controlling a combustion process producing exhaust gases and having a non-linear relationship between each of carbon monoxide, unburned hydrocarbons, and opacity with respect to air supplied, the method comprising:

detecting the quantity of at least two of three parameter chosen from the group consisting of carbon monoxide, opacity, and unburned hydrocarbons in the exhaust gases;

subtracting the quantity of each detected parameter from a predetermined quantity for that parameter to thereby derive an error signal for the parameter;

selecting the most negative of the error signals generated;

adjusting the selected error signal for the non-linear relationship between the parameter from which the error signal was generated and the air supplied to the combustion process to thereby generate a corrected error signal;

supplying the corrected error signal to a control apparatus to vary the amount of air supplied to the combustion process;

detecting the quantity of at least one of two constraints chosen from the group consisting of oxygen and exhaust gas temperature; and

comparing the quantity of the constraint detected with a predetermined quantity for at least one of the constraints to thereby prevent supplying the corrected error signal to the control apparatus if the quantity detected is not less than the predetermined quantity.

4,360,337
DAMPING DEVICE FOR A HELICOPTER ROTOR BLADE

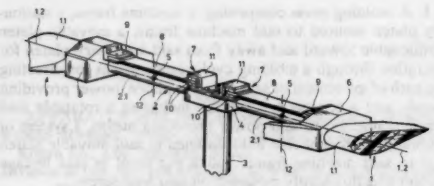
Hubert Frommlet, Siegertsbrunn, and Ludwig Stangl, Garching, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 175,022

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932441

Int. Cl.³ B64C *27/35*

U.S. Cl. 416—141 **14 Claims**



1. An apparatus for damping blade vibrations in the lead-lag direction of the blades of a helicopter rotor, comprising rotor head means and, at least one blade including a blade root, means operatively connecting said blade root to said rotor head means, said connecting means permitting blade angle movements and said blade vibrations, said connecting means including hinge means for permitting lead-lag movements of the blade, torsionally yielding rod means stiff against bending in the lead-lag direction, first securing means operatively connecting said rod means to said blade root means, second securing means operatively connecting said rod means to said rotor head means, one of said first or second securing means providing a substantially rigid connection, the other of said first or second securing means comprising elastic means arranged so as to permit elastically yielding movements of said rod means substantially only in the lead-lag direction for substantially damping vibrations of the respective blade in the lead-lag direction in the plane of rotation of said rotor.

4,360,338
CONTROL SYSTEM FOR DUAL COIL PILOT VALVE BURNER SYSTEM

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 19, 1980, Ser. No. 150,940

Int. Cl.³ F23Q *9/08*

U.S. Cl. 431—46 **10 Claims**

1. An ignition and control system for ignition of fuel discharged from a burner assembly including a main fuel burner having a fuel supply line connected thereto, a pilot burner to ignite fuel discharged from said main burner, and a pilot fuel supply line extending to said pilot burner, said system comprising:

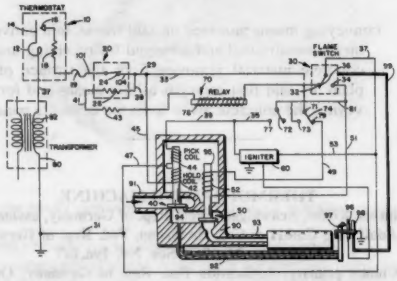
ignition means to ignite fuel discharged from said pilot burner;

a normally closed main gas valve and an electromagnetic main coil energizable to open said main gas valve;

a normally closed pilot gas valve and electromagnetic pick and hold coils energizable to open said pilot gas valve;

condition sensing switch means for connection in circuit to a voltage source;

lockout switch means including a lockout switch which in a closed position is in circuit with said condition sensing switch means, and further including heating means in circuit with said condition sensing switch means in said closed position of said lockout switch, said heating means being operative upon prolonged energization of said heating means to move said lockout switch to an open position to open the circuit to said condition sensing switch means, said lockout switch in its closed position being in circuit with said hold coil for energization thereof;



combustion detection switch means having a cold switch pole, a hot switch pole in circuit with said main coil of said main gas valve, and a combustion detection switch engaging said cold switch pole, in circuit with said lockout switch, and responsive to the presence of a flame at said pilot burner to move from said cold switch pole to said hot switch pole for opening said main burner; and

ignition switch control means including switch actuating means in circuit with said heating means and said cold switch pole, and further including ignition switch means operative upon energization of said switch actuating means to connect said pick coil in circuit with said lockout switch in said closed position of said lockout switch for opening said pilot gas valve in conjunction with said hold coil and for connecting said ignition means in circuit with said lockout switch in said closed position of said lockout switch whereby fuel discharged from said pilot burner can be ignited, the absence of ignition of said fuel discharged from said pilot burner resulting in said prolonged energization of said heating means and movement of said lockout switch to said open position.

4,360,339
FLUIDIZED BOILER

Henry J. Blaskowski, Avon, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

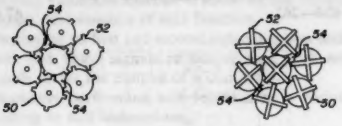
Filed Feb. 2, 1981, Ser. No. 230,216

Int. Cl.³ F27B *15/00*; F23D *13/18*

U.S. Cl. 432—58 **2 Claims**

1. A fluidized-bed cell of the type including a static ignition be of inert heat-storage particles, a fluidizing region disposed above and immediately adjacent to the static ignition bed, means for feeding fuel particles into the static ignition bed, means for igniting the fuel particles fed to the static ignition bed, and means for blowing air upwardly through the static bed so as to carry the fuel particles into the fluidizing region and fluidize the fuel particles within the fluidizing region but

not fluidize the inert heat-storage particles forming the static ignition bed, characterized in that the inert heat-storage particles are generally spherical in shape with each of said particles having a plurality of protuberances extending outwardly from



its surface for a preselected length, and each of said generally spherical heat-storage particles has six cylindrical knob-like protuberances extending outwardly from its surface for a uniform preselected length, each protuberance spaced at a 90 degree spherical angle from its neighboring protuberances.

4,360,340

THERMAL DEVELOPER FOR DRY SILVER PHOTOGRAPHIC PAPER

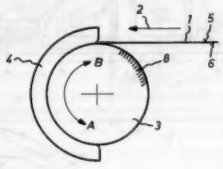
Hans-Werner Peters, Raisdorf, and Klaus Weiss, Kirchbarkau, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 156,403

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 2923260

Int. Cl.³ F27B *9/28;* F26B *13/00*

U.S. Cl. 432—59 **3 Claims**



1. Improved apparatus for heat treating sheets of photographic material being passed in spaced succession to a heating station, said heating station having a rotary-driven drum, the exterior surface of which is fibrous for engaging the underside of each sheet with the fibers to conduct the sheet in a forward direction of rotation of said drum, and a stationary, heated surface adjacent to and coextensive with the exterior surface of said drum along the portion of a drum circumference for engaging with the upper surface of each sheet being passed through the heating station by said drum, the improvement commprising:

means for rotating said drum in the reverse direction during the times between transport of sheets through said heating station, so as to displace the fibers at the exterior surface of said drum against said heated surface such that the outer tips of the fibers are inclined in the forward direction of rotation of said drum.

4,360,341

ORTHODONTIC METHOD FOR TREATING MALOCCLUSION

Eugene L. Dellinger, 1326 Old Lantern Trail, Fort Wayne, Ind. 46825

Filed Mar. 16, 1981, Ser. No. 243,873

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—24 **9 Claims**

1. The method of positioning a bracket in a predetermined position on a patient's tooth comprising the steps of forming a locating fixture with an internal cavity provided with lingual and labial or buccal sides having one portion complementary to preselected surface anatomy of a given tooth and a second portion spaced from and overlying in general parallelism one of the labial, buccal or lingual surfaces of said tooth, fitting a bracket-orienting element onto said second portion in a predetermined relationship therewith as determined by mating orienting portions on both said element and said second portion,

said element having a bracket-receiving portion adapted to orient a bracket relative to said second portion, engaging a bracket with said bracket-receiving portion, said element thereby being disposed within said cavity, and transferring said bracket to the patient's tooth by registering said one portion of the cavity of said fixture with said preselected tooth surface anatomy.

4,360,342

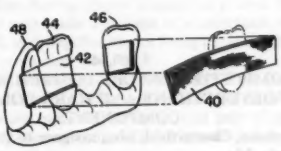
METHOD FOR REPLACING LOST TEETH

Christopher A. Salvo, 656 King St., Port Chester, N.Y. 10573

Filed Nov. 12, 1980, Ser. No. 205,986

Int. Cl.³ A61C *13/22*

U.S. Cl. 433—172 **6 Claims**



1. A method for replacing lost teeth without removal of substantial portions of abutment teeth whereby a bridge may be permanently fixed in a patient's mouth comprising: providing a support having a plurality of holes therethrough, and a predetermined shape and configuration said support having at least one pontic mounted thereon at a predetermined location; removing a portion from the adjacent teeth conforming to the shape of said support and from about 0.5 to about 1 millimeter deep to just below the enamel-dentin junction to form a support receiving preparation with resistance and retention form for holding the support against lateral movement to resist dislodgement and retain the support in the preparation; drilling holes at predetermined locations in said adjacent teeth; mounting said support and pontic on said adjacent teeth in said preparation and fixing said support thereto with pins on screws through the holes therein and into the holes drilled in the tooth structure; and covering said support with a dental filling.

4,360,343

METHOD FOR THE ORAL IMPLANTATION OF A DENTAL PROSTHESIS

Mamed Hussein, 408, rue Rougemont, Longueuil, Quebec, Canada (J4J 2B6)

Filed Nov. 4, 1980, Ser. No. 204,077
Int. Cl.[3] A61C 8/00
U.S. Cl. 433—173 12 Claims

1. An implant to be inserted into an artificial tooth socket, said implant comprising:

(a) a pair of elongated parts each having an inside surface and an outside surface;

(b) each of said parts having a complementary beveled recess on said inside surfaces;

(c) serrated edges positioned on an outer surface of each part;

(d) said beveled recesses being interengaged upon insertion whereby said serrated edges on each part do not extend beyond the outer surface of the other part during insertion; and

(e) a separating member having beveled edges engaging said beveled recesses in said elongated parts whereby said separating member when inserted into said beveled recesses of said elongated parts comprising said implant separates said first elongated part from said second elongated part and drives said serrated edges of said elongated parts into the walls of the artificial socket.

4,360,344

COMPOSITE DENTURE COMBINING SOFT POLYURETHANE AND HARD POLYMER COMPONENTS

Ralph Colpitts, Chesterfield, Mo., assignor to Polythetics, Inc., St. Louis, Mo.

Filed Mar. 31, 1981, Ser. No. 249,643
Int. Cl.[3] A61C 13/00
U.S. Cl. 433—199 7 Claims

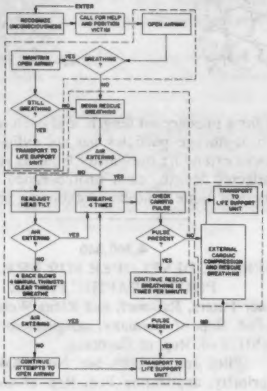
1. An artificial denture of composite construction which comprises a pre-formed tooth-holding portion which has been ground out to provide room for a mouth-engaging portion integrally chemically bonded to said tooth-holding portion, said tooth-holding portion being fabricated from a hard non-polyurethane polymer having a hardness of not less than about Shore D40 selected from the group consisting of a hard acrylic polymer and a hard epoxide polymer and a mouth-engaging portion being fabricated from a soft non-hydrophilic polyurethane elastomer having a hardness of not greater than about Shore A65, said polyurethane being the reaction product of a polyether polyol and an aliphatic, cycloaliphatic or aralkyl di- or polyisocyanate in which the isocyanate groups are directly bonded to the aliphatic, cycloaliphatic or alkyl moieties thereof.

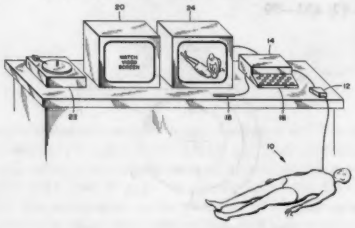
4,360,345

HEALTH EDUCATION SYSTEM

David Hon, Dallas, Tex., assignor to American Heart Association, Inc., Dallas, Tex.

Filed Jul. 14, 1980, Ser. No. 167,963
Int. Cl.[3] G09B 23/28, 5/06
U.S. Cl. 434—262 47 Claims





1. An interactive instruction system for teaching an individual comprising:

(a) a peripheral having at least one sensor thereon for producing a signal representing a function which has been or is to be manually performed by said individual,

(b) a first means for storing a sequence of signals representing instructions relating to the correct manner of performing said function,

(c) a first video display coupled to said storing means for displaying said instructions,

(d) a second means for storing video and associated audio signals representing both pictorial and oral representations of the correct manner of performing said function,

(e) a second video display for displaying said pictorial representation, and

(f) a computer coupled to said peripheral, said first and second storage means and said first and second displays for causing an ordered sequence of said instruction signals in said first signal storage means to be displayed by said first display whereby said individual may learn to recognize and to perform said function, for receiving said signals from said peripheral and detecting correct or incorrect performance of said function by said individual and for causing appropriate ones of said stored video signals to be displayed by said second display and said associated audio signals to be produced to illustrate the correct performance of said function if incorrectly performed by said individual whereby telling, showing and coaching of said individual in the recognition and performance of said function may be accomplished.

24. A method of computerized instruction and testing of an individual in performing a predetermined function comprising the steps of:

(a) storing a sequence of signals representing instructions relating to the correct performance of said function,

(b) storing video and associated audio signals relating to the correct performance of said function,

(c) displaying on first and second video displays said instructions and video signals in conjunction with said audio signals under the control of a computer,

(d) manually performing said function on a peripheral according to said instructions,

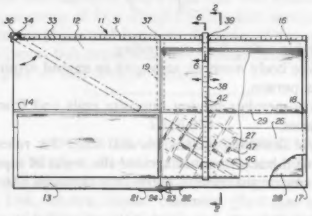
(e) detecting any incorrect performance of said function, and

(f) displaying appropriate ones of said instructions and video signals in conjunction with said audio signals under the control of said computer to illustrate the correct manner of performing said function that was incorrectly performed whereby the need for an actual instructor and live instruction is eliminated.

4,360,346
MAP HOLDING AND LOCATING KIT

Kamaran Ehsanipour, 400 Davey Glen Rd., Apt. 4525, Belmont, Calif. 94002

Filed Jul. 18, 1980, Ser. No. 170,136
Int. Cl.³ G09B *29/10*
U.S. Cl. 434—153 3 Claims



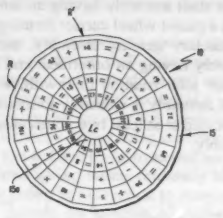
1. A map and holder comprising a cover, a map, said map having streets and street names thereon, means for precisely locating said map in said cover, a top scale along the top edge of said cover, a vertical scale, cooperating means on said top and vertical scales so that said vertical scale may be slid along said top edge, said scales having markings along their lengths, whereby by consulting an index of streets for said map which provides a horizontal and a vertical coordinate for the location of the name of a street to be located, the user moves the vertical scale along the top scale until it is at the horizontal coordinate and then reads down the vertical scale to the vertical coordinate to locate where the street name is printed on said map, said cover being made of at least four rectangular sections hinged together along two transverse lines so that said holder may be folded along both said lines into compact form, said map being foldable along the same lines as the holder, said top scale being foldable at a first said line, said vertical scale being pivoted to said first said scale to swing perpendicular to said first said line.

4,360,347
MATHEMATICAL EDUCATIONAL GAME DEVICES

Mansour Ghaznavi, 1020 University Blvd., Silver Spring, Md. 20903

Filed Dec. 31, 1980, Ser. No. 243,971
Int. Cl.³ G09B *19/02*; A63F *9/00*
U.S. Cl. 434—198 15 Claims

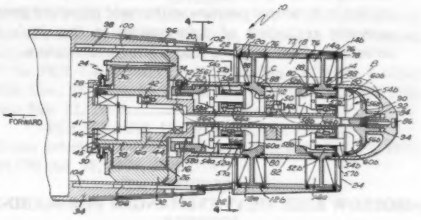
1. A two dimensional educational puzzle device, comprising a plurality of interfitting members forming a circular shape when properly interfitted in contact with each other, said members having a plurality of numbers and arithmetic operators printed thereon, said numbers and operators on said members, when properly interfitted, establishing radially and circumferentially correct mathematical equations.



4,360,348
UNDERWATER VEHICLE PORTING SYSTEM

Michael DeMarco, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1981, Ser. No. 236,476
Int. Cl.³ F42B *19/01*
U.S. Cl. 440—67 4 Claims



1. A propelling system comprising:

a housing having means for receiving a fluid and an aft end with an exit port adapted to jettison fluid;

a pair of counterrotating impellers enclosed in said housing, said impellers having blades adapted to jettison fluid out of said exit port under the force of acceleration imparted to the fluid, said impeller blades being enclosed at the tips by a solid outer rim;

spacing means for separating said impellers from each other on a common axis a sufficient distance to allow fluid to stabilize when transiting between said pair of impellers, said spacing means comprises a channel that is void of radial obstructions;

driving means for driving said impellers, the complete driving means being concentric with said impellers; and

ball bearings supporting the outer rim of said blades.

4,360,349
MARINE TRANSMISSION

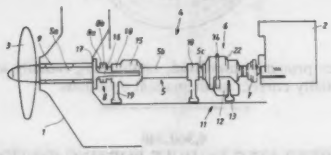
Hans-Erik Hansson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Oct. 17, 1979, Ser. No. 86,022
Claims priority, application Sweden, Oct. 24, 1978, 7811028; Aug. 31, 1979, 7907246
Int. Cl.³ B63H *5/06*
U.S. Cl. 440—75 13 Claims

1. A marine transmission for a ship having a hull structure which is subjected to deformation wherein the transmission transmits propulsion forces from propulsion generating machinery through a propeller shaft assembly to a propeller mounted thereon, and comprising:

a coupling having a first end attached to said propulsion generating machinery and having a second end attached to a planetary gearing assembly;

said propeller shaft assembly having an innermost end provided with a planet wheel carrier forming an integral part of said planetary gearing assembly, and said propeller shaft assembly having an outermost end attached to said propeller for joint rotation therewith, wherein said propeller shaft assembly is rotatably journalled within radial bearings located at at least two points along said propeller shaft assembly;



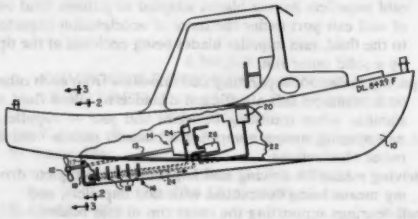
said marine transmission further comprising a housing assembly including a gear housing portion enclosing said planetary gearing assembly, said innermost end of said propeller shaft assembly being rotatably journalled within a pair of radial support bearings mounted within said housing assembly to maintain said attached planet wheel carrier in its proper position within said planetary gearing assembly regardless of deformations in the ship's hull structure which supports said marine transmission.

4,360,350

HOLLOW KEEL HEAT EXCHANGER FOR MARINE VESSELS

Albert D. Grover, 94 S. Long Beach Ave., Freeport, Nebr.W YORK 11520

Filed Jun. 11, 1980, Ser. No. 158,539
Int. Cl.³ B61D *27/00*
U.S. Cl. 440—88 **6 Claims**



1. In a marine vessel having a hull with a downwardly projecting closed hollow keel and propulsion means cooled by closed loop, fresh water circulating cooling means, the improvement which comprises:

means sealing said hollow keel from the hull interior to form a keel chamber;

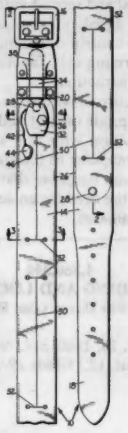
means providing for the circulation of sea water through the keel chamber when the vessel is moving through the water comprising inlet apertures in at least one side of the keel and at least one outlet aperture in the rear end of the keel; and

wherein the cooling means includes heat exchange means disposed in said keel chamber and operative with the sea water circulating therethrough to effect heat exchange and thereby cool the fresh water in the cooling means.

4,360,351

INFLATABLE SAFETY BELT

A. Robert Travinski, 6801 NE. 137th St., Vancouver, Wash. 98665

Filed Oct. 12, 1979, Ser. No. 84,177
Int. Cl.³ B63C *9/16*
U.S. Cl. 441—94 **1 Claim**

1. An inflatable safety belt comprising

(a) a strip-like body member arranged to extend around the waist of a person,

(b) said body member having opposite ends and front and rear surfaces,

(c) releasable fastening means on said ends for releasably securing said body member around the waist of a person,

(d) one or more slit means extending through the front surface of said body member,

(e) said slit means comprising a plurality of spaced longitudinal slits and transverse slits intersecting said longitudinal slits,

(f) a single flat air-tight expandable bladder extending along the rear surface of said body member in the area substantially between the fastening means at the ends,

(g) means securing said bladder at its ends to said body member,

(h) controllable inflating means on said body member operatively associated with said bladder and arranged when actuated to inflate said envelope,

(i) said bladder, upon being inflated, expanding forwardly through said slit means to form a buoyant life preserver,

(j) and a transverse loop on said body member in the area of said inflating means arranged to hold an opposite overlapping end portion of said body member over said inflating means to protect it.

4,360,352

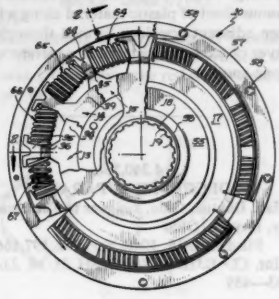
EXTENDED TRAVEL VIBRATION DAMPER ASSEMBLY

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 27, 1981, Ser. No. 248,116
Int. Cl.³ F16D *3/14*
U.S. Cl. 464—64 **6 Claims**

1. A vibration damper assembly to transmit torque between driving and driven members, comprising an input member adapted to engage torque input means, a hub assembly operatively connected to torque output means, and resilient means interposed between the input member and hub assembly, said input means including a pair of spring retainer plates secured together at their peripheries and journalled on said hub assembly, each retainer plate having three circumferentially equally

spaced inwardly offset drive straps defining elongated arcuate slots, said hub assembly including an internally splined hub barrel, a hub flange and three circumferentially equally spaced hub arms extending between and axially aligned with said drive straps, a spacer cup secured to said hub flange and providing a forwardly extending flange resulting in a cylindrical guide surface, three floating equalizers journalled on the cylindrical guide surface of the spacer cup, each equalizer having three circumferentially spaced arms lying in substantially the same plane as the hub arms, an arm of each equalizer located between two adjacent hub arms, and said resilient means including a group of four damper spring sets interposed between the retainer plates and between the arms of the equalizers and two adjacent hub arms, said drive straps being inwardly offset in the path of said damper springs.



4,360,353

POWER TRANSMISSION SYSTEM

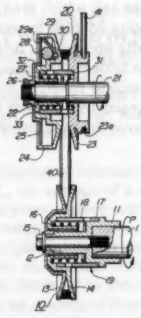
Yoshiyuki Hattori, Toyoake; Kazuma Matsui, Toyohashi, and Hiroji Kinbara, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 15, 1980, Ser. No. 140,594

Claims priority, application Japan, Aug. 28, 1979, 54-109511

Int. Cl.³ F16H 55/52

U.S. Cl. 474—12 5 Claims



5. A power transmission system for transmitting torque of a driving shaft to a driven shaft, said system comprising:

a driving pulley unit provided on said driving shaft;

a driven pulley unit provided on said driven shaft;

an endless V-belt extending around said driving and driven pulley units;

said driving pulley unit including a first stationary pulley rotatable with said driving shaft, a first movable pulley disposed in opposite relationship to said first stationary pulley to cooperate therewith to define a first circumferentially continuous groove for receiving said V-belt, said first movable pulley being movable axially of said driving shaft toward and away from said first stationary pulley, and a first spring means resiliently biasing said first movable pulley in a direction to decrease the width of said first groove;

said driven pulley unit including a second stationary pulley rotatable with said driven shaft, a second movable pulley disposed in opposite relationship to said second stationary pulley to cooperate therewith to define a second circumferentially continuous groove for receiving said V-belt, said second movable pulley being movable axially of said driven shaft toward and away from said second stationary pulley, a second spring means resiliently biasing said second movable pulley in a direction to increase the width of said second groove, fly weights operative to move said second movable pulley in a direction to decrease the width of said second groove by the centrifugal forces produced when said driven pulley unit is rotated, and guide means fixed to said driven shaft for guiding said fly weights;

a first cam mechanism operative to decrease the width of said first groove in accordance with the magnitude of the load torque; and

a second cam mechanism operative to increase the width of said second groove in accordance with the magnitude of the load torque.

4,360,354

MACHINE FOR THE TREATMENT OF WEB MATERIAL

Thomas D. Bishop, Solihull, England, assignor to The Deritend Engineering Co. Ltd., England

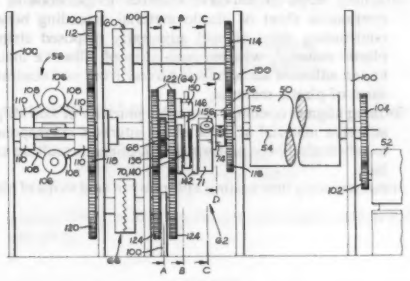
PCT No. PCT/GB79/00117, § 371 Date Mar. 17, 1980, § 102(e) Date Mar. 17, 1980, PCT Pub. No. WO80/00231, PCT Pub. Date Feb. 21, 1980

PCT Filed Jul. 17, 1979, Ser. No. 190,521

Claims priority, application United Kingdom, Jul. 17, 1978, 30101/78; Jul. 18, 1978, 30251/78

Int. Cl.³ B31B 1/16

U.S. Cl. 493—22 11 Claims



1. A machine for treating continuous web to produce a series of longitudinally successive blanks, comprising at least two sets of treatment rolls each including a form-carrying roll for cooperation with the web, and means for feeding the web at a substantially constant speed successively through the nips of said roll sets, wherein the improvement comprises

(a) a variable speed electrical motor connected to drive each form-carrying roll through a constant speed transmission,

(b) a sensor connected to each form-carrying roll which provides an electrical output representing the instantaneous roll speed and the location of a datum position on the roll,

(c) a programmable computer, responsive to the electrical output of said sensor, which controls the speed of each variable speed electrical motor to drive the connected form-carrying roll at a constant speed while the form

engages the web, and at a programmed varying speed during the remainder of each revolution of the roll to maintain close spacing of the successive blanks produced by the form-carrying rolls, and

(d) means associated with each form-carrying roll for transmitting energy in a selected direction between said transmitting means and said roll during said remainder of each revolution of said roll to assist the connected motor in varying the speed of said roll.

4,360,355

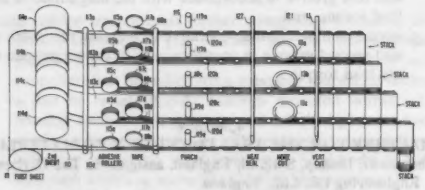
ADHESIVE ENVELOPE FOR A SHIPPING LABEL OR THE LIKE

Heikki S. Suominen, Tampere, Finland

Continuation-in-part of Ser. No. 160,394, Jun. 17, 1980, abandoned, which is a continuation of Ser. No. 913,147, Jun. 6, 1978, abandoned. This application Sep. 17, 1980, Ser. No. 188,158

Int. Cl.³ B31B *41/60*

U.S. Cl. 493—196 **7 Claims**



1. A method for mass producing a plurality of separate, identically-shaped adhesive envelopes of the type employed in attaching an insert to a container surface and the like, said method comprising the following steps:

positioning a plurality of separate strips of plastic material side-by-side on a continuous sheet of plastic material, wherein each strip of plastic material is spaced from adjacently disposed strips of plastic material;

attaching strips of adhesive material to portions of said continuous sheet of plastic material extending between confronting sides of said adjacently disposed strips of plastic material, wherein each strip of adhesive material has an adhesive surface facing away from said continuous sheet of plastic material;

forming aligned openings through a plurality of said strips of adhesive material at preselected intervals corresponding to substantially the uniform width of each resulting envelope;

simultaneously heat sealing a plurality of said strips of plastic material to said continuous sheet of plastic material along a surface extending between said openings, in a direction substantially perpendicular to said strips of adhesive material;

simultaneously cutting through a plurality of said separate strips of plastic material and said attached continuous sheet of plastic material along said heat sealed surface; and

cutting through each layer of adhesive material and attached continuous sheet of plastic material along a line extending between adjacent openings formed through said respective layer of adhesive material to separate said envelopes from one another.

4,360,356

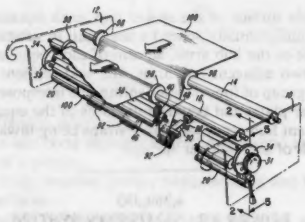
DECURLER APPARATUS

Byron C. Hall, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Oct. 15, 1980, Ser. No. 197,166

Int. Cl.³ B31B *37/00*; B65H *23/18, 23/10*

U.S. Cl. 493—459 **16 Claims**



1. Apparatus for removing curl from a continuously moving web, comprising a first roller, a second roller, the rollers being in spaced-apart substantially parallel relationship, a shaft spaced from the rollers and substantially parallel thereto, a pair of closely spaced engagement bars positioned between the shaft and the second roller, the engagement bars being angularly movable about an axis which is adjacent the engagement bars, the apparatus being adapted to receive a continuous web which extends partially around the first roller, then partially around the shaft, then between the engagement bars, and then partially around the second roller, at least one of the engagement bars being engaged by the web for applying pressure upon the web to remove the curl therefrom.

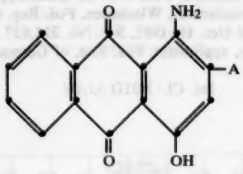
4,360,357

TRANSFER-PRINTING CARRIERS: RED COMPONENT DYE MIXTURE FOR POLYACRYLONITRILE

Wolfgang Mehl, Geneva, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

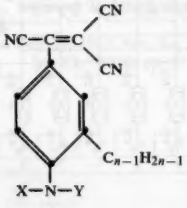
Filed Jun. 18, 1981, Ser. No. 275,028
Claims priority, application Switzerland, Jun. 20, 1980, 4753/80
Int. Cl.³ D06P 1/645
U.S. Cl. 8—471 7 Claims

1. In a transfer-printing carrier which carries a design which is volatile at 180° to 210° C., the improvement wherein the design is one which contains as the red component a mixture of dyes of the two types



I.

and



II.

wherein A is methoxy, phenoxy or hydroxyethoxy, n is an integer having a value of at most 4, X is a hydrogen atom or lower alkyl, and Y is lower alkyl, the dyes of the types I and II present in the mixture being in the ratio to one another of 1:3 to 3:1.

4,360,358

IMMUNOASSAY WITH SOLID PHASE HAVING COATING CONTAINING BLOOD PLATELET SUBSTITUTE

Yash Sharma, 2766 January Cts., Falls Church, Va. 22043

Filed Mar. 7, 1980, Ser. No. 127,989
Int. Cl.³ G01N 33/54, 33/56
U.S. Cl. 23—230 B 9 Claims

1. A method for preparing an immunologically active coated solid phase by coating the surface of a solid support material having an organic polymer surface with an immunologically active agent which comprises the steps of:

(a) contacting the organic polymer surface of the solid support material with an aqueous coating solution having a pH-value of from about 8.5 to about 10.5 and comprising dissolved therein an amount of from about 0.035 to about 0.05 mol/l of a water soluble protein-compatible primary or secondary hydroxy lower alkyl amine, an amount of between 0.05 and about 20 g/l of a water/soluble immunologically active agent and an amount of from about 0.05 to about 10 g/l of a blood platelet substitute which is a brain extract containing phospholipids and cephalin for a sufficient period of time to allow an immunologically effective amount of the immunologically active agent to be attached to the organic polymer surface of the solid support material to obtain an immunologically active coating therein,

(b) removing the coating solution from the coated solid support material

(c) allowing the coated solid support material to dry.

4,360,359

METHOD FOR RELATING SHALLOW ELECTRICAL ANOMALIES TO THE PRESENCE OF DEEPER HYDROCARBON RESERVOIRS

Dorothy Z. Oehler, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Mar. 13, 1981, Ser. No. 243,235
Int. Cl.³ G01N 31/12, 33/24
U.S. Cl. 436/28 24 Claims

1. A method for detecting subterranean hydrocarbon deposits comprising:

(a) surveying earth formations by induced polarization to detect an electrical anomaly,

(b) sampling said anomalous earth formations

(c) analyzing said anomalous earth formations to determine whether said anomalous earth formation contains metallic sulfides which are not spacially associated with kerogen or coal, and when said anomalous earth formations contain metallic sulfides that are not associated with kerogen or coal, thereafter,

(d) analyzing said anomalous earth formations to determine whether the anomaly is caused by seeped hydrocarbons, hydrocarbon-induced anomalies indicated by

(1) accumulations of seeped gases as determined by C_1 to C_4 hydrocarbon concentration in ppm exceeding $_{10}(2+10$ (TOC in %)), where TOC=total organic carbon concentration and where methane has a $\delta^{13}C$ value between $-58°$ and $-30°/oo$;

(2) accumulations of seeped oils where ground sample analyses show

(a) (HC)/(OC) ratios greater than 20, where HC=C_{15} and heavier hydrocarbon concentrations in ppm and OC=percent total organic carbon multiplied by 100; or

(b) (HC)/(OC) ratios between 2 and 20, where indigenous organic carbon is gas-prone; or

(c) Peak I/Peak II ratios, determined by temperature-programmed pyrolysis greater than 1, and/or

(3) accumulations of seeped oils where data from headspace plus cuttings gases of canned samples show

$$\frac{C_5 \text{ to } C_7 \text{ hydrocarbon concentrations}}{C_1 \text{ to } C_4 \text{ hydrocarbon concentrations}}$$

greater than 0.5 or

$$\frac{C_2 \text{ to } C_4 \text{ hydrocarbon concentrations}}{C_1 \text{ hydrocarbon concentrations}}$$

greater than 1, where the indigenous organic carbon is dry gas-prone.

4,360,360

CENTRIFUGAL ANALYZER

Steven G. Chiknas, Vienna, Va., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 2, 1981, Ser. No. 250,107
Int. Cl.³ G01N 21/07
U.S. Cl. 23—230 R 34 Claims

34. A method for chemical analysis using a centrifugal analyzer comprising a rotor including a rotatable shaft, a circular cuvette ring having an inner wall defining a central opening and slots extending radially outwardly from the central opening with the ring being positioned on the rotor encircling the shaft, the method comprising the steps of:

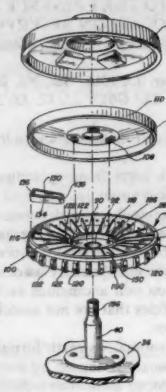
providing a circular carrier member which defines a central aperture and also defines on its top surface a plurality of slots;

providing a plurality of disposable container-like inserts;

placing said inserts into said carrier member slots;

adding to said inserts samples to be tested;

positioning said carrier member within the central opening of the cuvette ring, with said shaft extending through the central aperture of the carrier member; and



rotating said circular cuvette ring and said carrier member together.

4,360,361

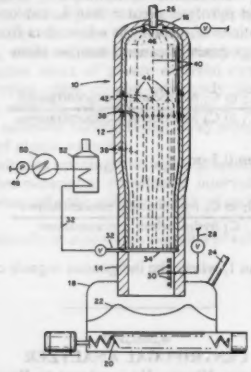
COAL GASIFICATION APPARATUS

Charles K. Nagy, Monaca, Pa., assignor to United States Department of Energy, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 257,088

Int. Cl.³ C10J *3/68*

U.S. Cl. 48—77 **4 Claims**



1. Coal hydrogenation apparatus comprising:

a reaction vessel having (1) a vertically disposed tubular wall with an upper end and a lower end, the inner surface of said tubular wall circumscribing a reaction chamber, (2) a cover attached to the upper end of said tubular wall, (3) a coal inlet in said cover, (4) a plurality of flow passages located in direct heat transfer relation within said tubular wall and extending vertically from the lower portion thereof toward said cover, said flow passages being circumferentially spaced apart from one another in said tubular wall, and (5) a plurality of feed holes located within said tubular wall and respectively communicating with said flow passages and the interior of said reaction chamber, said plurality of feed holes comprising: a plurality of first feed holes equidistant from said cover; and a plurality of second feed holes equidistant from said cover and located between said cover and said first feed holes, wherein a plurality of said flow passages are joined together within said tubular wall between said first feed holes and said second feed holes; and

means for forcing hydrogen through said flow passages and said feed holes into the interior of said vessel.

4,360,362

VALVE CONTROL OF AN ADSORPTION PROCESS

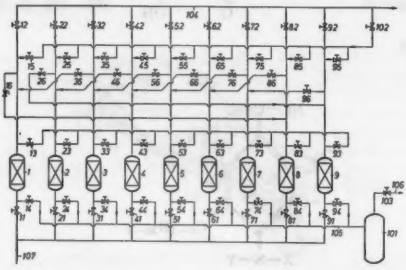
Stefan Asztalos, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 311,827

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040495

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—21 **7 Claims**



1. In a cyclically operated pressure-swing adsorption apparatus for purifying and separating gases wherein a plurality of adsorbers are connected at their respective intakes to a raw gas supply line, the exhaust ends thereof are connected through respective valves to a product gas line, and the adsorbers are interconnected by plural common purge gas lines through a respective plurality of valves for allowing gas to flow between the adsorbers, the improvement comprising:

said valves being pneumatically actuated valves, and wherein a single pneumatic control line having pneumatic control means is connected to all the valves of one of said plural common purge gas lines for providing an individual pneumatic control signal to each one of the valves in each purge line for controlling the opening and closing thereof, and electronic signal control means connected to said pneumatic control means for electronically controlling the operation of all the valves.

7. In a method of cyclically operating a pressure-swing adsorption apparatus for purifying and separating gases wherein a plurality of adsorbers are connected at their respective intakes to a raw gas supply line, the exhaust ends thereof are connected through respective valves to a product gas line, and the adsorbers are interconnected by plural common purge gas lines through a respective plurality of valves allowing gas to flow between the adsorbers, the improvement comprising a method of controlling said valves wherein a single pneumatic control line having pneumatic control means is provided for all the valves in each purge line for controlling the opening and closing thereof, the improved method steps comprising:

transmitting an electronic control signal to the pneumatic control means for causing said pneumatic control means to transmit a pneumatic signal through said signal pneu-

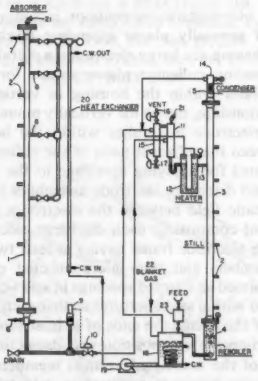
matic control line to the valves associated with the purge line, individually controlling the transmission of said pneumatic signal to each one of said valves by means of electromagnetic control valves operatively associated with a computer, and located respectively between said single pneumatic control line and each valve, by transmitting respective individual on or off signals from said computer to the respective electromagnetic control valves for transmitting or cutting off said pneumatic signal to each one of said valves for specifically changing the condition of each one of the respective electromagnetic control valves.

4,360,363

PHYSICAL SOLVENT FOR GAS SWEETENING

Charles R. Ferrin, and William P. Manning, both of Sand Springs, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 16, 1982, Ser. No. 349,423
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—73 **6 Claims**



1. The process for the absorption and removal of hydrogen sulfide and other acid gases from a mixture of gases which comprises,

scrubbing the mixture of gases with a physical solvent comprising an aqueous solution of an alkanolpyridine in an absorption zone in which the hydrogen sulfide and other acid gases are absorbed,

conducting the solvent containing the absorbed gas to a desorption zone,

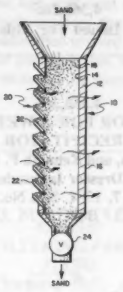
liberating the absorbed hydrogen sulfide and other acid gases from the solvent to thereby regenerate the solvent, and recycling the regenerated solvent to the absorption zone.

4,360,364

FILTERING METHOD AND APPARATUS THEREFOR

Arthur L. Kohl, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 963,551, Nov. 24, 1978, abandoned.
This application Dec. 17, 1981, Ser. No. 331,932
Int. Cl.³ B01D *46/04, 46/32*
U.S. Cl. 55—96 **20 Claims**



1. A filter apparatus for removing fine particulates from a gas stream comprising:

a housing containing a substantially gas-permeable microporous filter element having restricted flow paths therethrough for the collection, adjacent an upstream face thereof, of fine particulates from a gas stream with an efficiency greater than 80 percent;

a substantially vertical granular material retention member having upstream and downstream faces and provided with openings for the substantially unimpeded flow of a fine particulate-containing gas stream therethrough, said retention member being located in said housing and having its downstream face spaced apart from the upstream face of said microporous filter element to provide a passageway therebetween;

a body of granular material disposed in said passageway and permeable to the flow of the fine particulate-containing gas stream therethrough;

gas inlet means for the delivery of the fine particulate-containing gas stream to the upstream face of said retention member for passage through said retention member and body of granular material to the upstream face of said microporous filter element for collection of particulates from the gas stream;

means for scouring the upstream face of said microporous filter element with the granular material by at least intermittent movement of said body of granular material adjacent said upstream face of said microporous filter element to remove collected fine particulates therefrom; and

gas outlet means for the removal of a substantially particulate-free gas stream from a downstream face of said microporous filter element, said retention member, body of granular material, and microporous filter element providing the sole means for gas communication between said gas inlet and gas outlet means.

9. A method of removing fine particulates from a gas stream comprising:

passing a fine particulate-containing gas stream through a body of granular material to a substantially gas-permeable microporous filter element;

collecting said particulates adjacent an upstream face of said microporous filter element;

scouring said upstream face of said microporous filter element to remove the particulates therefrom by moving said body of granular material across said upstream face of said

microporous filter element, thereby maintaining the gas stream pressure drop across the body of granular material and the microporous filter element within a desired range while concurrently removing particulate contaminants from the gas stream; and

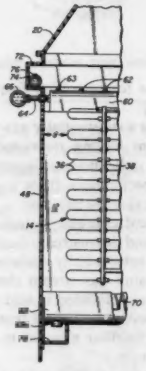
withdrawing a substantially particulate-free gas stream from the downstream face of said microporous filter element.

4,360,365
Patent Not Issued For This Number

4,360,366
LIQUID DISTRIBUTOR FOR A WET ELECTROSTATIC PRECIPITATOR

Marvin K. Collins, Mesa, and Kenneth F. Blatter, Phoenix, both of Ariz., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 7, 1981, Ser. No. 309,177
Int. Cl.³ B03C 3/16, 3/53
U.S. Cl. 55—119 **4 Claims**

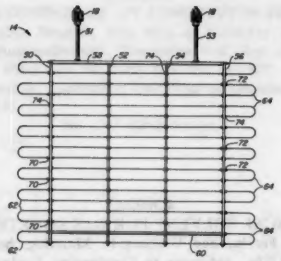


1. In a wet electrostatic precipitator including a housing, a plurality of collector electrodes vertically mounted within the housing, a plurality of discharge electrode assemblies mounted within the housing with one electrode assembly being mounted equidistantly spaced between each pair of the collector electrodes, means adapted for applying a high voltage to the discharge electrode assemblies to form electrostatic fields between the respective pairs of collector electrodes, and a liquid distributor arrangement adapted for flushing the collector electrodes with rinse liquid, said distributor arrangement including a plurality of elongated distributor members, means supporting one of said distributor members directly over each of the collector electrodes, each distributor member being tubular and extending adjacent the top edge of the associated collector electrode and having an inlet opening for providing ingress of rinse liquid, and a plurality of tubular overflow nozzles secured projecting vertically upward at substantially uniform longitudinal spacings in each distributor member, each nozzle having an open upper end located outwardly of the associated distributor member and an inner end located within the associated distributor member, wherein the improvement comprises: the end overflow nozzle of each distributor member located nearest the distributor member inlet opening being closed at its lower inner end and having a flow inlet aperture defined through the tubular wall thereof at a location within the distributor member upwardly displaced from its inner end and being positioned in a directional orientation generally facing toward the inlet opening thereat of the associated distributor member.

4,360,367
DISCHARGE ELECTRODE ASSEMBLY AND ITS MANUFACTURE

William F. Prior, Glendale, Ariz., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 25, 1981, Ser. No. 295,970
Int. Cl.³ B03C 3/16, 3/41; H01J 9/02
U.S. Cl. 55—145 **3 Claims**



1. In an electrostatic precipitator including a housing, a plurality of generally planar extending discharge electrode assemblies having discharge electrodes, a plurality of generally planar extending collector plates, means for mounting the collector plates within the housing in vertical, horizonally spaced relationships, means for vertically mounting each of the discharge electrode assemblies within the housing equidistantly between the adjacent pairs of the collector plates, and means adapted for applying a voltage to the discharge electrodes of said discharge electrode assemblies to thereby form an electrostatic field between the electrodes and plates, the improvement comprising: each discharge electrode assembly including an electrode frame having at least two spaced apart vertical members and two interconnected cross members, apertures formed at selected spacings in said vertical members, tubes affixed within said apertures so that each tube extends in the plane of the frame, the ends of at least some of said tubes being of crimpable composition and projecting substantially outwardly of the associated vertical members at both ends, electrode wire segments received in said tubes, each wire segment being of a substantially J-shape with the sraight portion of each segment being received within and extending between a pair of tubes that are respectively affixed to the spaced apart vertical frame members, the inwardly projecting end of one of said pair of tubes being crimped to secure the corresponding end of the respective straight wire portion to the electrode frame, each wire segment further including a curved portion extending between a pair of vertically adjacent tubes to extend outwardly of the vertical frame members in the plane of the frame, the outwardly projecting end of one of each of said vertically adjacent tubes being crimped to secure the end of the associated curved wire portion to the electrode frame.

3. A method of manufacturing a discharge electrode assembly for use in an electrostatic precipitator comprising the steps of:

forming an equal number of uniformly spaced, aligned bores in first and second frame members,

affixing a tube in each of said bores,

securing at least two cross members extending transversely between said first and second frame members so that the frame members and cross members together form a rectangular frame with said tubes aligned with the plane of the rectangular frame and so that the tubes of the first and second frame members are aligned with each other,

forming several electrode wire segments each into a substantially J-shape including a straight portion terminating in a first end and a curved portion terminating in a second end.

inserting the formed electrode wire segments into the tubes so that (a) the first ends of one half of electrode wire segments are engaged in the inner ends of first tubes affixed to one of the frame members, (b) the second ends of said one-half of the segments are engaged in the outer ends of second tubes affixed to the other frame member, (c) the first ends of the remaining half of the segments are received in the inner ends of said second tubes and (d) the second ends of said remaining half of the segments are received in the outer ends of said first tubes whereby the adjacent pairs of electrode wire segments each form a loop, and

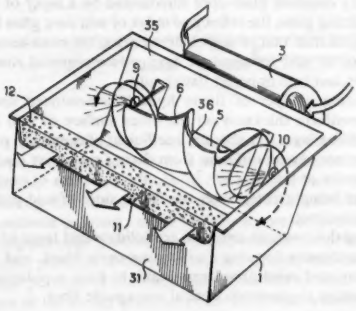
crimping the ends of those tubes that receive the ends of the wire segments to secure the electrode wire segments to the frame.

4,360,368

AIR-CONDITIONER EMPLOYING THE EVAPORATION OF WATER FOR A CAB OF A MACHINE OR VEHICLE

Roland Lyon, Couture sur Loir, 41800 Montoire, France

Filed Oct. 15, 1980, Ser. No. 197,324
Claims priority, application France, Oct. 18, 1979, 79 26112
Int. Cl.³ B01F *3/04*
U.S. Cl. 55—259 **16 Claims**



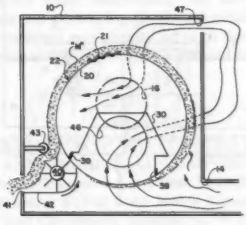
1. An air-conditioner employing the evaporation of water for cabs of machines, vehicles or the like, comprising a case, means defining a lateral inlet for the air to be treated at one lateral end of the case, and means defining an outlet for the treated air at an opposite end of the case, watertight partition wall means defining an evaporation chamber inside the case and extending up from the bottom of the case for sealing off said inlet from any water which might accumulate in the bottom of the evaporation chamber, means for blowing the air in the case and connected to said inlet, the watertight partition wall means defining at least one blown air inlet orifice which is spaced upwardly away from the bottom of the evaporation chamber and communicates with said inlet, means for connection to a water supply for forming a water mist, which mist-forming means are disposed in the vicinity of and below said orifice and on a side of said partition wall means remote from said inlet so that the mist is encountered by a stream of air issuing from said orifice, said orifice being calibrated at such size relative to the rate of flow of air from the air blown by the blowing means through said inlet that the air stream which issues from the orifice has sufficient speed to constitute an anti-return barrier which opposes the passage of the mist of water back through said orifice toward said air blowing means, and draining means for ensuring that water does not accumulate and stay in the bottom of the evaporation chamber.

4,360,369

APPARATUS FOR FILTERING PARTICULATES FROM A FLUID

Kurt W. Niederer, Charlotte, N.C., assignor to The Terrell Machine Company, Charlotte, N.C.

Filed Mar. 9, 1981, Ser. No. 241,826
Int. Cl.³ B01D *46/00*
U.S. Cl. 55—283 **7 Claims**



1. An apparatus for separating entrained particulate matter from a conveying fluid wherein particulate matter is collected and deposited in an overlying porous layer on an upstream side of a fluid-permeable filter support and wherein the porous layer of particulate matter is used as a filtering medium of enhanced filtering capacity; and consisting essentially of:

(a) an enclosed housing having a fluid inlet and a fluid outlet therein;

(b) said filter support being positioned within said enclosed housing for removing at least some entrained particulate matter from fluid as fluid is passed through the filter support from the upstream side to the downstream side thereof;

(c) a filter making zone defined within said enclosed housing by a fluid flow into said fluid inlet and through a first pre-determined part of said filter support from the upstream to the downstream side thereof for collecting the entrained particulate matter into said overlying porous layer;

(d) a filtration zone defined within said enclosed housing by a fluid flow through a second pre-determined part of said filter support from the upstream to the downstream side thereof and through said fluid outlet, the second pre-determined part of said filter support having thereon the overlying porous layer of particulate matter made in the filter making zone;

(e) chamber means defined by walls positioned on the downstream side of said filter support at the juncture of said filter making zone and said filtration zone said walls defining on one side thereof said filter making zone and on the other side thereof said filtration zone and sealingly engaging the downstream side of said filter support against fluid flow therebetween on the downstream side thereof but omitting sealing means between the interior of the enclosed housing and said filter support at the juncture of the filter making zone and the filtration zone; and,

(f) conduit means for conveying fluid from said filter making zone on one side of and from said chamber defined by said walls into the housing on the upstream side of the filtration zone;

whereby said filter making zone and said filtration zone are physically defined on the downstream side of said filter support by said chamber means and effectively but not physically defined on the upstream side of said filter support by fluid flow.

4,360,370

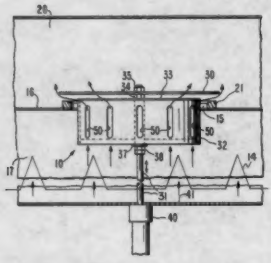
POPPET VALVE FOR BAGHOUSE OUTLET PLENUM

Miles J. McAndrew, Norwalk, Conn., assignor to General Electric Co., Lebanon, Pa.

Continuation of Ser. No. 87,860, Oct. 24, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 242,089

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—302 **2 Claims**



1. An apparatus for removing dust from a dust-laden gas stream, said apparatus comprising a baghouse in which at least one bag filter is mounted, means for directing said dust-laden gas stream in a first direction with respect to said bag filter so that dust can be removed from said gas stream and form a cake on said bag filter leaving dust-free gas to pass through said bag filter into said baghouse, a wall of said baghouse being apertured to provide an opening through which said dust-free gas can be drawn from said baghouse into a clean gas plenum, means for periodically stopping flow of said dust-laden gas stream in said first direction and for directing a stream of dust-free gas from said clean gas plenum in a second direction with respect to said bag filter, said second direction being opposite to said first direction, means for closing said opening when said dust-free gas stream is being directed in said second direction and for opening said opening after flow of said dust-free gas stream in said second direction has stopped following removal of said dust cake from said bag filter,

said means for closing and opening said opening comprising a poppet valve, said poppet valve including a valve plate affixed to a valve stem, said valve stem being translatable so that said valve plate can be moved to a position covering said opening when said opening is to be closed and to a position away from said opening when said opening is to be opened, with a gas flow restricting means being affixed to said valve stem, said gas flow restricting means thereby being positionable in said opening as said valve stem is being translated to open said opening until said bag filter has been re-inflated following removal of said dust cake from said bag filter, said gas flow restricting means being elongate along an axis through said opening and configured so that as said bag filter is being re-inflated and as said closure member is moved away from said opening, the gas flow rate is gradually increased while said gas flow restricting means is positioned in said opening, said opening having a circular edge, said gas flow restricting means comprises a skirt having a generally cylindrical wall coaxially surrounding and spaced apart from said valve stem, said opening having a circular edge, said cylindrical wall having a diameter that is smaller than the opening to form an annular clearance therebetween that permits restricted air flow therethrough, an end of said, skirt removed from said valve plate being uncovered, and wherein said cylindrical wall of said skirt includes at least one longitudinally extending orifice adapted to permit an increasing reinflation air flow while the skirt is still within the opening but being moved through the opening.

4,360,371

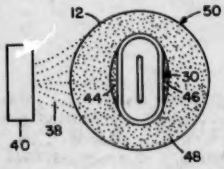
METHOD OF MAKING POLARIZATION RETAINING SINGLE-MODE OPTICAL WAVEGUIDE

Michael G. Blankenship, Corning; Donald B. Keck, and Arnab Sarkar, both of Big Flats, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 30, 1981, Ser. No. 249,022

Int. Cl.³ C03B *19/00, 37/075*

U.S. Cl. 65—3.12 **5 Claims**



1. A method of fabricating an optical waveguide fiber comprising the steps of

providing a preform foreproduct having an oblong, centrally disposed glass core surrounded by a layer of inner cladding glass, the refractive index of said core glass being greater than that of said cladding glass, the cross-sectional shape of said foreproduct having two opposed rounded sides and two opposed flatter sides,

depositing a layer of flame hydrolysis-produced soot in nonuniform thickness on the outer surface of said inner cladding layer, the thermal coefficient of expansion of said glass soot being different from that of said inner cladding layer by at least 1×10^{-7}/° C., the thickness of said soot layer being greatest over the flatter sides of said preform foreproduct,

heating the resultant article to consolidate said layer of glass soot, thereby forming a solid glass draw blank, and

drawing said solid glass draw blank to form a polarization retaining single-mode optical waveguide fiber.

4,360,372

FIBER OPTIC ELEMENT FOR REDUCING SPECKLE NOISE

Roman Maciejko, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 10, 1980, Ser. No. 205,464

Int. Cl.³ C03B *23/207;* **G02B** *5/16*

U.S. Cl. 65—4.21 **14 Claims**

1. A fiber optic system element comprising a length of optical fiber having a plurality of filaments fused together, the filaments having refractive indices differing from one another to give a random refractive index profile distribution across the element, the element thereby characterized by a large number

of possible optical path lengths for light propagating from one end of the element to a remote end thereof, each such path

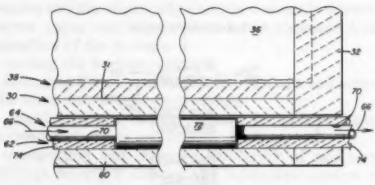
length depending upon the position of incidence of a light ray at said one end.

4,360,373

METHOD OF AND APPARATUS FOR CONTROLLING EROSION OF A REFRACTORY THRESHOLD

George A. Pecoraro, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 2, 1981, Ser. No. 250,500
Int. Cl.[3] C03B *18/16*
U.S. Cl. 65—99.2 9 Claims



1. In a glassmaking process in which a stream of molten glass flows longitudinally from a melting furnace into a forming chamber over a transversely extending refractory threshold, wherein the flow of molten glass on the threshold causes the threshold to erode more rapidly at center portions than at marginal edge portions, the improvement comprising: cooling center portions of the threshold at a greater rate than marginal edge portions of the threshold are cooled so that the temperature of the center portions of the threshold is reduced relative to the temperature of the marginal edge portions to a sufficient extent to render erosion of the threshold more uniform over its entire glass contact surface.

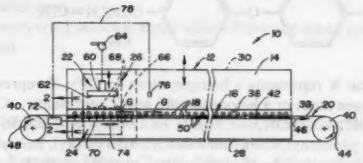
6. A structure for delivering a stream of molten glass from a melting furnace onto a pool of molten metal in a forming chamber, comprising a refractory threshold extending transversely across the path of glass flow and positioned to contact and support the molten glass stream immediately before it contacts the molten metal, cooling means in heat exchange relationship with the threshold for retarding erosion of the threshold, the heat exchange relationship having variations in the transverse direction so as to provide a greater cooling rate in center portions of the threshold than in end portions, whereby erosion of the threshold is made more uniform.

4,360,374

ROLL OPERATOR FOR GLASS SHEET CONVEYOR OF BENDING SYSTEM

John S. Nitschke, 324 E. Second, Perrysburg, Ohio 43551

Continuation-in-part of Ser. No. 209,782, Nov. 24, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,332
Int. Cl.[3] C03B *23/025*
U.S. Cl. 65—273 13 Claims



1. In a glass sheet bending system including a horizontal roller conveyor for conveying heated glass sheets, said conveyor including elongated rolls extending horizontally transverse to the direction of conveyance in a parallel relationship to each other, each roll having a central rotational axis, a drive mechanism for rotatively driving the rolls about the rotational axes thereof to convey glass sheets supported thereby, and bending apparatus for receiving heated glass sheets from the conveyor to perform bending thereof, the improvement comprising: a roll shifter for shifting a plurality of rolls adjacent the bending apparatus along the direction of conveyance during driving thereof while maintaining the parallel relationship therebetween and permitting continued rotation of these rolls about the rotational axes thereof so as to thereby provide the control of glass sheet conveyance adjacent the bending apparatus.

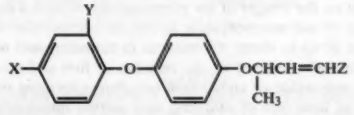
4,360,375

PHENOXYPHENOXY UNSATURATED DERIVATIVES AND HERBICIDAL COMPOSITION

Kazuo Jikihara, Kakegawa; Shigekazu Itoh; Shuichi Takayama, both of Shimizu; Koichi Sato; Ichiro Kimura, both of Shizuoka, and Isao Chiyomaru, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 6,387, Jan. 25, 1979, Pat. No. 4,263,040.
This application Dec. 23, 1980, Ser. No. 219,503
Claims priority, application Japan, Feb. 18, 1978, 53-17785; Jul. 7, 1978, 53-82732; Oct. 14, 1978, 53-126592
The portion of the term of this patent subsequent to Aug. 17, 1996, has been disclaimed.
Int. Cl.[3] C07C *69/76*; A01N *9/24, 37/06*
U.S. Cl. 71—88 10 Claims

1. Phenoxyphenoxy unsaturated derivative having the formula

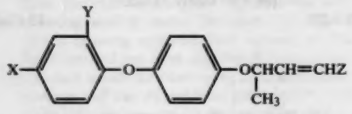


(I)

wherein X represents a halogen atom or CF_3; Y represents a hydrogen atom or a halogen atom; and Z represents —COOR, —COR", —CH_2OH or —CH_2OR"' and R represents cyanoethyl, dialkylaminoethyl, alkoxyalkyl, benzyl, dialkylbenzyl, alkylbenzyl, halobenzyl, pyridinomethyl, furfuryl, cycloalkyl, methylcycloalkyl, phenyl, halophenyl, methyl phenyl, alkoxy alkyleneoxy alkyl, methoxymethylbutyl group, a metal atom, amino, alkylamino or arylamino group; and when X is a halogen atom, R can be an alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl or hydrogen atom group; and R" represents a hydrogen atom, amino, alkylamino, dialkylamino, phenylamino or

phenylamino group which may be substituted by halo or alkyl group, and R''' represents an acetyl, chloroacetyl, benzoyl, ethoxycarbonyl, methylcarbamoyl or phenylcarbamoyl group.

5. A herbicidal composition which comprises a phenoxy-phenoxy unsaturated derivative having the formula



(I)

wherein X represents a halogen atom or CF_3; Y represents a hydrogen atom or a halogen atom; and Z represents —COOR, —COR'', —COOH, —CH_2OH or —CH_2OR''' and R represents cyanoethyl, dialkylaminoethyl, alkoxyalkyl, benzyl, dialkylbenzyl, alkylbenzyl, halobenzyl, pyridinomethyl, furfuryl, cycloalkyl, methylcyloalkyl, phenyl, halophenyl, methyl phenyl, alkoxy alkyleneoxy alkyl, methoxymethylbutyl group, a metal atom, amino, alkylamino or arylamino group; and when X is a halogen atom, R can be an alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl or hydrogen atom group; and R'' represents, amino, alkylamino, dialkylamino, phenylamino or phenylamino group which may be substituted by halo or alkyl group, and R''' represents an acetyl, chloroacetyl, benzoyl, ethoxycarbonyl, methylcarbamoyl or phenylcarbamoyl group.

8. A method of treating plants with a herbicide, comprising: applying a herbicidally effective amount of the herbicidal composition of claim 5 to the soil or the foliage of plants.

4,360,376

MICROENCAPSULATED TRIFLURALIN

Robert C. Koestler, Wayne, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 221,174, Jan. 29, 1981, abandoned, which is a continuation of Ser. No. 12,095, Feb. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 887,576, Mar. 17, 1978, abandoned. This application Apr. 6, 1981, Ser. No. 251,606

Int. Cl.³ A01N *25/28*

U.S. Cl. 71—121 **10 Claims**

1. A herbicide product comprising an aqueous dispersion of microcapsules of a solution of alpha, alpha, alpha-trifluoro-2,6-dinitro-N,N-di(C_1–C_5) alkyl-p-toluidine dissolved in at least 20% up to about 60% of an aromatic petroleum solvent, based on the weight of said solution, said toluidine being present in said dispersion in a phytotoxic amount, said solution microencapsulated within a resinous polycondensate wall selected from the group consisting of polyurea, polyamide and amide-urea copolymers, the weight of said wall ranging from 2.5 to 40% based on the weight of the microcapsule, at least a major proportion of said microcapsules having an average size of at least about 10 up to about 100 microns in diameter, said polycondensate wall prepared by the reaction of first and second polyurea, polyamide or amide-urea copolymer-forming intermediates, at least one of said first and second intermediates containing from 0 to 100 percent, based on the weight of the intermediate, of a polyfunctional reactant which (a) is complementary to the other of said intermediates and effective for crosslinking reaction and (b) has at least three reactive groups that are effectively functional in said reaction, said reactive groups selected from the class consisting of amine, isocyanate, —COCl and SO_2Cl groups, said intermediate containing at least 5% of said polyfunctional reactant when the weight of the wall is 10% or less, and, said intermediate containing less than 100% of said polyfunctional reactant when the weight of said wall is 10% or greater.

4,360,377

FERROMAGNETIC METAL PARTICLES, CONSISTING ESSENTIALLY OF IRON AND CARRYING A SURFACE COATING, AND THEIR PRODUCTION

Werner Steck, Mutterstadt; Hermann Roller, Ludwigshafen; Wilhelm Sarnecki, and Werner Balz, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,663

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1980, 3026696

Int. Cl.³ H01F *1/06*

U.S. Cl. 75—0.5 AA **4 Claims**

1. Ferromagnetic metal particles, consisting essentially of iron and comprising a core, containing not less than 85% by weight of metallic iron, and an iron oxide plus chromium oxide surface layer surrounding this core, wherein in the surface layer contains, in addition to iron, oxygen and from 1 to 9% by weight of chromium, based on the total amount of the metal particles, at least one element selected from the group comprising zinc, phosphorus in the form of phosphate, aluminum, calcium, strontium, barium, cadmium, lead, cobalt and nickel, in a total amount of not more than 9.5% by weight, based on the total amount of the metal particles.

4,360,378

DIRECT REDUCTION OF IRON OXIDE CONTAINING MATERIAL WITH BIOFUEL

Olle B. Lindstrom, Lorensviksvägen 14, S-183 63 Täby, Sweden

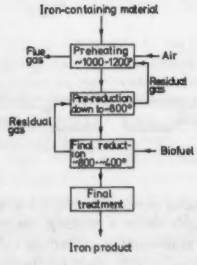
PCT No. PCT/SE80/00058, § 371 Date Oct. 29, 1980, § 102(e) Date Oct. 29, 1980, PCT Pub. No. WO80/01808, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 29, 1980, Ser. No. 201,394

Claims priority, application Sweden, Mar. 1, 1979, 7901867

Int. Cl.³ C21B *13/06*

U.S. Cl. 75—34 **17 Claims**



1. A method for the reduction of an iron oxide-containing material comprising:

(a) preheating an iron oxide-containing material in a preheating zone;

(b) passing said preheated iron oxide-containing material to a first reduction zone wherein said material is contacted with a reducing gas under suitable conditions of temperature and pressure to partially reduce said iron oxide in said material;

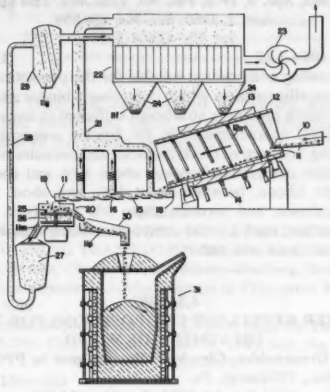
(c) passing said material to a second reduction zone wherein said iron oxide is contacted with a finely divided biofuel selected from the group consisting of wood, wood waste, straw, kelp and peat under suitable conditions of temperature and pressure and further reduced while producing a reducing gas, said reducing gas being passed to said first reduction zone; and

(d) recovering the reduced material from said second reduction zone.

4,360,379
PROCESS FOR THE REMOVAL OF RUST FROM CAST IRON BORINGS AND THE LIKE IN PREPARATION FOR MELTING

Dewein H. Naffziger, P.O. Box 1029, Trumbull County, Warren, Ohio 44482

Filed May 12, 1980, Ser. No. 148,651
Int. Cl.³ C21C 5/42
U.S. Cl. 75—43 4 Claims



1. A process for pretreating rusty cast iron borings and converting the rust from ferric oxide and chemically combined water to ferrosoferric oxide which comprises the steps of:
(a) charging the rusty borings into a heated drier;
(b) tumbling and heating the said borings to a temperature of at least 608° F. in said drier at which temperature conversion of the ferric oxide rust to ferrosoferric oxide rust occurs and the chemically combined water is driven off as water vapor and the converted rust loosened from the metallics of the borings;
(c) cooling the borings;
(d) screening the converted rust and borings and separating the same into two size screenings;
(e) discharging the smaller of said screenings containing ferrosoferric oxide and metallic borings; and
(f) transporting and charging the larger of said screened borings having a substantially oxide-free content into a melting furnace.

4,360,380
PROCESS FOR RECOVERY OF METAL VALUES FROM SLUDGES

George L. Zarur, Springfield, Va., assignor to World Resources Company, McLean, Va.

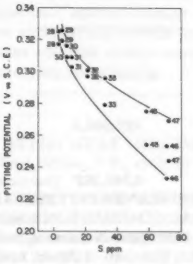
Filed Sep. 9, 1980, Ser. No. 185,463
Int. Cl.³ C22B 15/00
U.S. Cl. 75—97 R 5 Claims

1. A process for improving the yield of metal values recovered by hydrometallurgical extraction after incineration of organic sewage sludge which has as a principal ingredient organic matter with trace quantities of certain metal values occluded therein and which has inorganic matter including silica, alumina, lime and other uncombined metal values, and wherein the organic content of the dewatered sewage sludge is degraded by incineration at a temperature controlled to leave the silica substantially unfused and to oxidize the organic matter to produce an ash suitable for hydrometallurgical processing to recover selected metal values, the process comprising:
(a) incinerating dewatered organic sewage sludge at a controlled temperature below the fusion temperature of silica to degrade the sewage sludge and release the occluded metal values while continuously preventing complexing of metal values released by degradation of the organic matter with glasslike matrices in the resulting ash;
(b) continuing the incineration at said controlled temperature without fusing said inorganic matter until all the organic matter is oxidized while introducing excess oxygen and stirring the sludge;
(c) subsequently acid leaching the ash to produce a liquid component containing the metal values and solid components containing the unfused silica and other inorganic matter; and
(d) recovering selected metal values from said liquid component.

4,360,381
FERRITIC STAINLESS STEEL HAVING GOOD CORROSION RESISTANCE

Yoshio Tarutani, Minoo; Taishi Moroishi, Kobe, and Masao Koike, Nishinomiya, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Nippon Stainless Steel Co., Ltd., Tokyo, both of, Japan

Filed Apr. 7, 1981, Ser. No. 251,771
Claims priority, application Japan, Apr. 11, 1980, 55/47678; Feb. 13, 1981, 56/19658
Int. Cl.³ C22C 38/26
U.S. Cl. 75—126 F 25 Claims



1. A ferritic stainless steel exhibiting improved corrosion resistance, which consists essentially of:
Si: 0.01–5.00% by weight,
Mn: 0.01–5.00% by weight,
Cr: 8.0–35.0% by weight,
Nb: 0.20–1.00% by weight wherein Nb≧(8×C%+0.20%) and the balance iron with incidental impurities of which the amounts of carbon, nitrogen, phosphorous, sulfur and oxygen are as follows:
C: not greater than 0.05% by weight,
N: not greater than 0.05% by weight,
P: not greater than 0.05% by weight,
S: not greater than 0.002% by weight, and
O: not greater than 0.02% by weight.

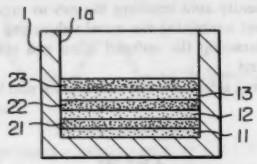
4,360,382
METHOD FOR MANUFACTURING EXTREMELY THIN MAGNETIC PLATES FOR MULTILAYER-TYPE HEAD CORES

Kenzaburo Iijima; Kazuo Kurahashi, and Toshiharu Hoshi, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 9, 1979, Ser. No. 65,345
Claims priority, application Japan, Aug. 11, 1978, 53-97841
Int. Cl.³ B22F 3/00
U.S. Cl. 75—200 20 Claims

1. An improved method of manufacturing extremely thin magnetic plates for multilayer-type head cores, comprising the steps of:

introducing alternate layers of a hard to work magnetic metallic material powder and a parting agent into a mold;
compressing said layers of material powder and parting agent together in said mold under sufficient pressure to cause said material powder and said parting agent to form



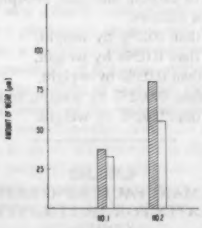
a unitary multilayer product having alternating layers of magnetic material powder and parting agent;
sintering said unitary multilayer product; and thereafter
separating said sintered multilayer product into a number of extremely thin magnetic plates defined by said sintered, compressed magnetic material powder layers.

4,360,383

ABRASION RESISTANT SINTERED ALLOY FOR INTERNAL COMBUSTION ENGINES

Kentaro Takahashi; Yoshikatsu Nakamura, both of Omiya, and Masajiro Takeshita, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1980, Ser. No. 144,114
Claims priority, application Japan, Apr. 26, 1979, 54-50931
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ B22F *3/10*
U.S. Cl. 75—236 **4 Claims**



1. An abrasion resistant sintered alloy for use in internal combustion engines which comprises 0.5 to 4.0% by weight of carbon, 5.0 to 30.0% by weight of Cr, 1.5 to 16.0% by weight of Nb, 0.1 to 4.0% by weight of Mo, 0.1 to 10.0% by weight of Ni and 0.1 to 5.0% by weight of P which permits liquid-phase sintering at temperatures not higher than 1,250° C., and the balance Fe and have 0.2 to 10% by volume of sintering pores at least 40% of which consist of pores having a pore size of not larger than 150 μm.

4,360,384

COMPOSITION FOR CORROSION PROTECTION USING METAL SILICIDES OR ALLOYS OF SILICON AND METALS

James P. McKaveney, Claremont, and Vernon P. Simpson, Laguna Beach, both of Calif., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 959,037, Nov. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 758,295, Jan. 10, 1977, abandoned, which is a continuation-in-part of Ser. No. 566,483, Apr. 9, 1975, Pat. No. 4,002,481. This application Apr. 3, 1980, Ser. No. 136,898
Int. Cl.³ C09D *5/08*
U.S. Cl. 106—1.12 **17 Claims**

1. A coating composition suitable for the protection of corrodible metallic surfaces which comprises a binder and a filler, the filler being present in an amount sufficient to impart corrosion-resistant characteristics to the coating composition and comprising conductive metal particles and particles of a metal composition comprising between about 50% and about 75% by weight silicon, between about 10% and about 25% by weight calcium, and between about 5% and about 25% by weight barium, such a metal composition being unstable when introduced alone into water.

4,360,385

WATER REPELLENT COMPOSITIONS FOR THE TREATMENT OF WOOD

John F. Grunewalder, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 12, 1981, Ser. No. 224,429
Int. Cl.³ C09K *3/18*; C09D *5/14*
U.S. Cl. 106—2 **13 Claims**

1. A treating composition, consisting essentially of:
(a) from about 1% to about 50% of a water-repellent selected from the group consisting of an alpha olefin having from 20 to 24 carbon atoms, a narrow cut alpha olefin blend, a narrow cut paraffin blend and mixtures thereof, wherein said olefin blend and paraffin blend consists essentially of a mixture of compounds of which at least about 50% have from 20 carbon atoms to 24 carbon atoms;
(b) at least about 0.5% of a material selected from the group consisting of
(i) from about 0% to about 6% of a wood preservative;
(ii) from about 0% to about 20% of an alkyd resin;
(iii) from about 0% to about 5% of an organic ionizable compound selected from the group consisting of quaternary ammonium halides, sulfates and hydroxides and alkyl and aryl esters of phosphorus-containing and sulfur-containing acids; and
(iv) mixtures thereof; and
(c) from about 45% to about 98% of an organic solvent.

4,360,386

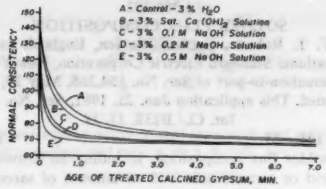
TREATING CALCINED GYPSUM WITH SOLUBILIZING AGENT

Larbi Bounini, Hanover Park, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Apr. 6, 1981, Ser. No. 251,425
Int. Cl.³ C04B *11/00*; C01F *5/42*
U.S. Cl. 106—110 **7 Claims**

1. A method of treating beta calcium sulfate hemihydrate having an initial high consistency which method comprises treating said hemihydrate with about 1–10 weight % of aqueous medium consisting of water and about 0.01–1 mole per liter of a gypsum solubilizing agent selected from the group consisting of sodium hydroxide, potassium hydroxide, calcium hydroxide, barium hydroxide, hydrochloric acid, nitric acid, sulfuric acid, phosphoric acid, boric acid, chromic acid, sodium chloride, sodium nitrate, sodium nitrite, sodium carbonate, sodium bicarbonate, rochelle salt, potassium chloride,

potassium nitrite, ammonium chloride, ammonium nitrate, ammonium carbonate, ammonium phosphate, ammonium oxylate, magnesia, borax, and mixture thereof to achieve an at least


A - Control - 3% H_2O
B - 3% Sat. Ca $(OH)_2$ Solution
C - 3% 0.1 M NaOH Solution
D - 3% 0.2 M NaOH Solution
E - 3% 0.5 M NaOH Solution
NORMAL CONSISTENCY
AGE OF TREATED CALCINED GYPSUM, MIN.

about 10% reduction, as compared to treating with water without said solubilizing agent, in dispersed consistency or healing time of the treated hemihydrate.

4,360,387

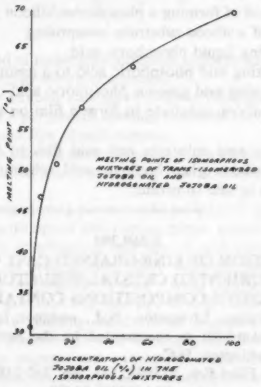
ISOMORPHOUS JOJOBA OIL COMPOSITIONS CONTAINING TRANS-ISOMERIZED JOJOBA OIL

James H. Brown, Chappaqua, and Harry Olenberg, Bronx, both of N.Y., assignors to Jojoba Growers & Processors Inc., New York, N.Y.

Continuation-in-part of Ser. No. 177,971, Aug. 15, 1980, Pat. No. 4,239,298. This application Mar. 9, 1981, Ser. No. 241,801

Int. Cl.³ C09D *3/26*

U.S. Cl. 106—243 **5 Claims**


MELTING POINT (°C)
MELTING POINTS OF ISOMORPHOUS MIXTURES OF TRANS-ISOMERIZED JOJOBA OIL AND HYDROGENATED JOJOBA OIL
CONCENTRATION OF HYDROGENATED JOJOBA OIL (%) IN THE ISOMORPHOUS MIXTURES

1. A homogeneous compositon consisting essentially of trans-isomerized jojoba oil having a liquifying point of 25°–44° C. and hydrogenated jojoba oil in the isomorphous state of mutual solution.

4,360,388

CERIUM CONTAINING PRECIPITATED SILICA, PROCESS FOR ITS PRODUCTION

Peter Nauroth, Wesseling; Robert Kuhlmann, Erftstadt; Günther Türk, Hanau; Rudolf Bode, Bad Orb, and Arthur Reisert, Kahl, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,434

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005137

Int. Cl.³ C09C *1/28;* **C08L** *83/04*

U.S. Cl. 106—288 B **12 Claims**

1. A cerium containing precipitated silica having the following physico-chemical properties:

BET-surface area according to DIN 66 131	m^2/g	140 ± 40
Loss on drying according to DIN 55 921	Wt.-%	2.0–4.0
Loss on ignition according to DIN 55 921	Wt.-%	2.5–12.5
pH-according to DIN 53 200		3.0–7.0
Conductivity in 4% aqueous dispersion at 20° C.	µs	500
Packed density according to DIN 53 194	g/l	80 ± 40
CeO_2-content, based on the material dried for 2 hours at 105° C.	Wt.-%	0.3–50
Sieve residue according to Mocker 45 µm (DIN 53 580)	Wt.-%	0.2

3. A process for producing the cerium containing precipitated silica of claim 1 comprising simultaneously adding a water glass solution and acid to water having a pH-value of 7 to 9 in a container at a temperature above 50° C. and up to the boiling point of the reaction mixture while employing shearing forces and holding the pH-value constant at 7 to 9 during a time span of 80 to 120 minutes, whereby after the termination of the precipitation there is present a pH-value of 7 to 9 in the reaction mixture, adding to the thus obtained precipitated silica original suspension and aqueous cerium (IV) salt solution adjusting the now acid reaction mixture to a pH-value of 6 to 8, washing the thus obtained cerium containing precipitated silica with water, drying and grinding.

4,360,389

ZIRCONIUM ALLOY HEAT TREATMENT PROCESS

Andrew W. Urquhart, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 853,048, Nov. 21, 1977, abandoned, which is a continuation of Ser. No. 632,478, Nov. 17, 1975, abandoned. This application Jun. 30, 1980, Ser. No. 164,883

Int. Cl.³ C21D *1/00;* **C22F** *1/18*

U.S. Cl. 148—11.5 F **6 Claims**

1. In the method or producing a boiling water reactor structural component of an alloy of zirconium substantially free of niobium and containing alloying components selected from the group consisting of tin, iron, chromium, nickel and oxygen, which method includes hot and cold working and annealing steps comprising a fabrication schedule, the combination of the steps of heating said structural component at a temperature and for a time sufficient for substantially completely transforming alpha phase to beta phase and dissolving substantially all intermetallic particles, cooling said structural component to about room temperature at a rate rapid enough to prevent intermetallic phase dissolved during the heating step from precipitating, subsequently heating said structural component to an intermediate temperature to cause precipitation of the intermetallic phase in the form of particles from about 100 to 400 Angstroms in diameter in two dimensional arrays along grain boundaries and sub-grain boundaries and retaining substantially all said intermetallic phase particles in said boundaries during any

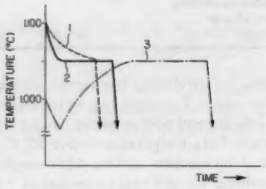
subsequent processing steps executed through and including installing said structural component in a boiling water reactor.

4,360,390

METHOD FOR DIRECT HEAT TREATING AUSTENITIC STAINLESS STEEL WIRE ROD

Jiro Tominaga; Wataru Shinada; Wataru Murata, and Masahiro Ito, all of Hikari, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 5, 1980, Ser. No. 184,325
Claims priority, application Japan, Sep. 6, 1979, 54/113563
Int. Cl.³ C21D *8/06*
U.S. Cl. 148—12 B **3 Claims**



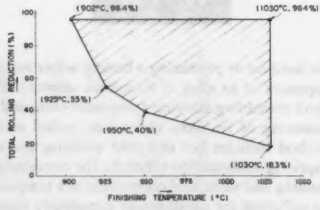
1. A method for directly heat treating an austenitic stainless steel wire rod which consists essentially of the steps of subjecting the wire rod to a finish hot rolling at a temperature suitable for the solution treatment of the wire rod, maintaining the wire rod from the final finish hot rolling step at a temperature within the solution treatment zone until the austenite crystal grain size number of the wire rod is in the range of 3.0 to 7.0 as determined by the JIS G0551 test, and subsequently quenching said wire rod at a rate and temperature below about 500° C., so that substantially no chromium carbide precipitation takes place, thereby producing an austenitic stainless steel wire rod having good cold working properties, such that the reduction of area percentage is at least about 79%.

4,360,391

PROCESS FOR PRODUCTION OF COIL OF HOT ROLLED STRIP OF AUSTENITIC STAINLESS STEEL

Takamasa Yamamura, Tokyo; Seiji Mori, Ichikawa; Koichi Asada, Kure; Kenichi Shinoda, Hiroshima, and Yuichi Higo, Kure, all of Japan, assignors to Nisshin Steel Co., Ltd., Japan

Filed May 22, 1981, Ser. No. 266,586
Int. Cl.³ C21D *8/02*
U.S. Cl. 148—12 E **2 Claims**



1. A process for the production of a coil of a hot rolled strip of austenitic stainless steel having recrystallization substantially completed and sensitization prevented, wherein a hot bar of austenitic stainless steel is hot rolled to a strip by passing through a train of finishing mill stands with a total rolling reduction and a finishing temperature controlled so that they fall within the hatched area shown in FIG. 1 of the attached drawings; and wherein the hot rolled strip so obtained is allowed to cool in air for a period of from 3 to 10 seconds, cooled with water and then coiled at a temperature of from 400° to 600° C.

4,360,392

SOLDER FLUX COMPOSITION

Daniel F. T. Roberts, Saffron Walden, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 154,265, May 29, 1980, abandoned. This application Jan. 23, 1981, Ser. No. 227,896
Int. Cl.³ B23K *35/34*
U.S. Cl. 148—23 **14 Claims**

1. A solder flux composition, including an amount of tartronic acid or tartaric acid and an amount of sarcosine dissolved in a solvent comprising water or a miscible mixture of water and one or more aliphatic alcohols, wherein the weight ratio of said amount of acid to said amount of sarcosine is from 90:10 to 30:70 and said amount of sarcosine is sufficient to suppress the de-wetting effects of the decomposition products of said acid produced by heating said flux to soldering temperatures.

4,360,393

VAPOR DEPOSITION OF H_3PO_4 AND FORMATION OF THIN PHOSPHORUS LAYER ON SILICON SUBSTRATES

Timothy D. Koval, Gaithersburg, Md., assignor to Solarex Corporation, Rockville, Md.

Filed Dec. 18, 1980, Ser. No. 217,742
Int. Cl.³ C30B *1/02*
U.S. Cl. 148—171 **10 Claims**

1. A method of forming a phosphorus/silicon glass layer on the surface of a silicon substrate, comprising

(a) providing liquid phosphoric acid,

(b) vaporizing said phosphoric acid to a gasous form,

(c) condensing said gaseous phosphoric acid on the surface of said silicon substrate to form a film on said substrate, and

(d) heating said substrate and said film to form a phosphorus/silicon glass layer on said substrate and a P-N junction in said substrate.

4,360,394

PRODUCTION OF FINE-GRAINED CAST CHARGES WITH UNORIENTED CRYSTAL STRUCTURE OF TNT OR EXPLOSIVE COMPOSITIONS CONTAINING TNT

Seymour Portnoy, Livingston, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1981, Ser. No. 230,225
Int. Cl.³ D03D *23/00*
U.S. Cl. 149—109.6 **4 Claims**

1. A method of producing cast charges of 2,4,6-trinitrotoluene having small unoriented crystal structure comprising adding an effective amount of one of 5-nitrobarbituric acid and the trihydrate thereof to a melt from which the cast charges are made.

4,360,395

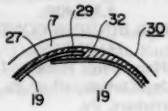
METHOD FOR PRODUCING A LAMINATED SHEATH

Fumio Suzuki, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 2, 1981, Ser. No. 250,376
Claims priority, application Japan, Apr. 10, 1980, 55/47707
Int. Cl.³ H01B *13/06*
U.S. Cl. 156—54 **34 Claims**

1. A method for producing a laminated sheath comprising the steps of: longitudinally supplying a tape; passing said tape through forming means for forming said tape into at least a partial tubular shape; passing said tape through a die for forming said tape into a desired tubular shape; supplying an adhe-

sive onto an outer surface of said tape prior to said tape passing through said die, said die filling at least a step portion formed



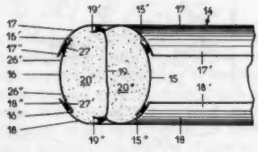
between overlapping edges of said tape with said adhesive; and thereafter covering said tape with a sheath.

4,360,396

INFLATABLE ELEMENT AND METHOD OF MAKING SAME

Gerard Marbach, Cernay, France, assignor to Sevylor, France

Filed May 6, 1980, Ser. No. 147,245
Claims priority, application France, May 17, 1979, 79 12930
Int. Cl.³ B29D *23/10*
U.S. Cl. 156—70 **7 Claims**



1. A method of making an inflatable element having the form of an closed ring, which comprises,

forming an annular carcass of flexible weldable sheet material with a peripheral opening bounded on opposite sides by opposite lips of said carcass,

providing a closing piece consisting of a closed belt of flexible weldable material having lips at its opposite lateral edges,

inserting said closing piece in said peripheral opening of said carcass with lips of said closing piece turned inwardly and internally overlapping said lips of said carcass and with portions of said closing piece adjacent said lips folded inwardly on themselves with a weld barrier between said infolded portions and said lips of said closing piece,

positioning a welding electrode in engagement with said infolded portions of said closing piece and contra-electrodes in engagement externally with said lips of said carcass, and activating said welding electrode and contra-electrodes to produce a sleeve coupling weld between said lips of said closing piece and said lips of said carcass throughout the periphery of said carcass to produce said closed ring.

4,360,397

PROCESS FOR THE MANUFACTURE OF RADIAL TIRES

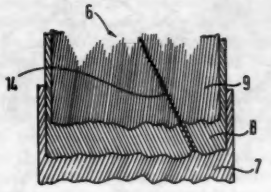
Renato Caretta, Varese, Italy, assignor to Societa Pneumatici Pirelli S.p.A., Milan, Italy

Filed Mar. 9, 1981, Ser. No. 242,149
Claims priority, application Italy, Mar. 18, 1980, 20716 A/80
Int. Cl.³ B29H *17/10*; **B60C** *9/20*
U.S. Cl. 156—134 **8 Claims**

1. A process for making radial tires comprising a radial carcass, a tread, an annular reinforcing structure inserted between the carcass and the tread, the said annular reinforcing structure comprising at least two layers of metallic cords, and in a radially outermost position, a third layer of textile cords that shrink in length under the effects of heat, said metallic cords, of each layer being disposed parallel to each other and crossed with the cords of the adjacent layer, and forming an angle with the longitudinal direction of the tire, said textile cords being disposed parallel to each other and forming with the longitudinal direction of the tire an angle which is not zero but is smaller than the angle formed by the metallic cords of the second metallic layer, said process comprising the steps of:

(a) constructing the radial carcass on a tire building drum;

(b) shaping the carcass in its unvulcanized state into a toric configuration;



(c) placing the reinforcing annular structure and the tread band on the toric shaped carcass; and

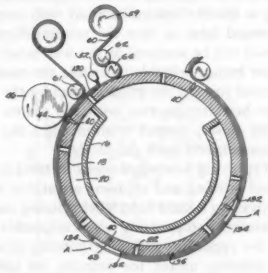
(d) molding and vulcanizing the tire, said method being characterized by the fact of joining the opposite ends of the third layer of the annular reinforcing structure along a line which extends in the direction of and at substantially the same angle as of the metallic cords of the second metallic layer.

4,360,398

METHOD FOR APPLYING ELASTIC BANDS TO WEBS

Reinhardt N. Sabee, Appleton, Wis., assignor to Sabee Products, Inc., Appleton, Wis.

Filed Mar. 9, 1981, Ser. No. 241,799
Int. Cl.³ B32B *31/08*
U.S. Cl. 156—164 **19 Claims**



1. A method for intermittently attaching lengths of elastic ribbon to spaced portions of a moving web comprising the steps of:

(a) feeding a stretched elastic ribbon to an elastic ribbon applying station having a base surface;

(b) holding said stretched elastic ribbon on the base surface;

(c) applying adhesive to discrete portions of said stretched elastic ribbon;

(d) feeding a web of substantially inelastic material to said ribbon applying station;

(e) adhering the lengths of stretched elastic ribbon to isolated portions of said inelastic web; and

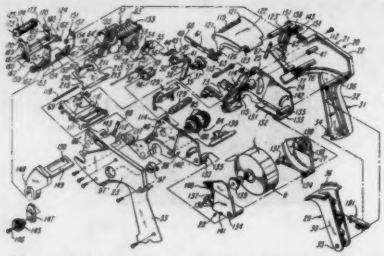
(f) maintaining at least a portion of said elastic ribbon in a stretched condition until the adhesive sets and cutting a non-adhered portion of said elastic ribbon by pressing cutting means simultaneously against the ribbon and a portion of the width of the web so as to sever only the ribbon.

4,360,399

HAND-HELD LABELER AND LABELING METHOD

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jun. 11, 1981, Ser. No. 272,794
Int. Cl.[3] B32B *31/04*
U.S. Cl. 156—277 22 Claims



1. Hand-held label printing and applying apparatus for printing and applying labels releasably carried on a carrier web, comprising: a frame having a handle, printing means including a print head and a platen cooperable with the print head at a printing zone, means for inking the print head, means for advancing the web to bring labels to be printed to the printing zone between the print head and the platen, means for delaminating printed labels, means for applying printed labels, a manually operable actuator disposed at the handle, means coupled to the actuator for moving the printing means to print on the labels and for moving the web advancing means to effect label delamination to dispense a printed label into label applying relationship with the label applying means, a masking member positioned immediately beyond the printing zone and at least a portion of the masking member in line with the printing zone being in closely spaced relation with respect to the surface of a printed label so that the printing applied at the printing zone will not be smeared as the web is advanced, the masking member being yieldable to enable the masking member to be deflected toward the printed label by the print head when the print head cooperates with the platen and being returnable to the closely spaced relation when the print head moves out of cooperation with the platen.

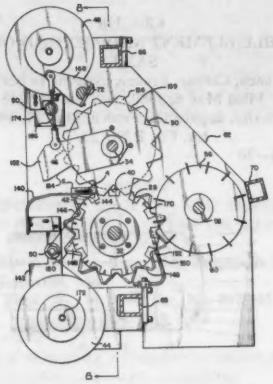
8. Method of applying a pressure sensitive label to a tag with a hand-held label printing and applying apparatus, comprising the steps of: providing a hand-held label printing and applying apparatus for printing and applying labels releasably carried on a carrier web, the apparatus including housing structure having a handle, printing means for printing on labels, means disposed adjacent the printing means for deliminating printed labels from the carrier web, a label applicator disposed adjacent the delaminating means for applying a printed label, means defining a label exit pathway at the underside of the label applicator, a manual actuator disposed at the handle, means moved by the actuator for moving the printing means to print on a label at the printing zone and to move the carrier web stepwise to bring the just printed label into label applying relationship with the label applicator at which only the trailing marginal edge of the just printed label remains adhered to the carrier web and at least the leading marginal edge of the just printed label projects into the label exit pathway in underlying relationship with respect to the label applicator, characterized in the steps of positioning a marginal end portion of a flexible tag in an initial position adjacent the label applicator, bending the tag away from and out of the label exit pathway, operating the actuator to print and dispense a label into the label applying relationship, and applying the label to the marginal end portion of the tag by moving the tag into contact with the label in the label exit pathway and pressing the label onto the tag using the label applicator while withdrawing the marginal end portion of the tag from the initial position.

4,360,400

APPARATUS FOR BINDING CONDUCTORS IN A HARNESS

Newton G. Davis, Harrisburg; Douglas J. Leiby, Enola, and Alden O. Long, Jr., Carlisle, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 6, 1981, Ser. No. 280,424
Int. Cl.[3] B32D *31/10*
U.S. Cl. 156—468 10 Claims



1. A bundling and binding apparatus which bundles a plurality of substantially parallel wires into a compacted sheaf and applies binding tape to the compacted sheaf, said apparatus comprising:

first and second bundling rolls, said rolls being mounted on first and second shafts which are in parallel spaced-apart relationship, said rolls having cylindrical surfaces which are in contact with each other in a nip zone,

first and second tape dispensing means associated with said first and second rolls, first and second bundling tapes extending from said dispensing means towards said rolls on one side of said nip zone, said tapes extending onto said cylindrical surfaces of said rolls, over said cylindrical surfaces and through said nip zone to the other side of said nip zone, said tapes having adhesive surfaces which are opposed to each other,

indexing means for indexing said first and second shafts in opposite directions of rotation through a predetermined angle of rotation,

a plurality of bundle receiving recesses on said cylindrical surface of said first roll, said recesses being located at equally spaced angular intervals and extending across said cylindrical surface and between the side surfaces of said first roll and

a plurality, equal to the number of said bundle receiving recesses, of gathering and guiding means mounted on at least one of the side surfaces of one of said rolls, each of said gathering and guiding means extending radially beyond the cylindrical surface of the associated roll and having opposed convergent surfaces, the opposed convergent surfaces extending towards the cylindrical surface of the roll whereby,

upon presentation of a bundle of wires to said rolls on said one side of said nip zone and indexing of said rolls, said bundle will be gathered and guided into one of said recesses by said gathering and guiding means, and said bundle will be passed through said rolls to the other side of said nip zone, and portions of said first and second bundling tapes will be adhered to said bundle to form a sheaf.

4,360,401

METHOD FOR MAKING ALUMINUM ALLOY LITHOGRAPHIC PLATES OR AL/CA LITHOGRAPHIC ALLOY

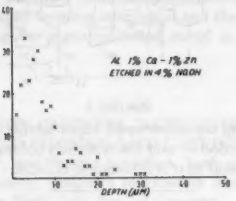
Alan Gray, Gerrards Cross, England, assignor to The British Aluminum Company Limited, London, England

Filed Jul. 18, 1980, Ser. No. 170,294

Claims priority, application United Kingdom, Jul. 20, 1979, 7925301

Int. Cl.³ C23F 1/00; B41M 5/00

U.S. Cl. 156—665 10 Claims



1. A method of making a lithographic plate from an aluminium base alloy containing 0.1% to 4.5% Ca together with normal impurities comprising subjecting at least one side of the plate to an alkaline etching process in a solution selected from sodium hydroxide and a solution produced by dissolving in water the hydroxides of alkaline metals or ammonia until a dense substantially uniform distribution of pits having an average depth ranging between 0.2 μm and 3.0 μm is formed on said one side.

4,360,402

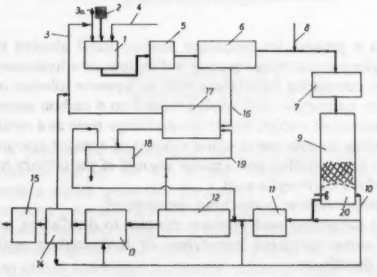
PROCESS AND APPARATUS FOR PREPARING WASTE PAPER FOR REUSE

Herbert Ortner; Lother Pfalzer, and Siegbert Fischer, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Mar. 27, 1979, Ser. No. 24,412

Int. Cl.³ D21C 5/02

U.S. Cl. 162—5 6 Claims



1. In a process for preparing waste paper for reuse in a paper machine comprising the steps of introducing water and waste paper to a pulper and coarse pulping therein, thickening the pulp suspension to stock densities of more than 10% by filtration and thereby separating waste water from the thickened pulp suspension, treating the thickened pulp suspension in a reaction tower in the presence of de-inking chemicals followed by thinning of the suspension, and separation of inks from the suspension by flotation in flotation apparatus; the improvement comprising introducing at least some of the de-inking chemicals in the pulper so that the waste water from the thickening step contains ink particles, and subsequently processing the ink particle containing waste water independent of the processing of the thickened pulp suspension by separating particles of ink from the water yielded during said thickening step by flotation in auxiliary flotation apparatus, and reintroducing into the process the clean water obtained from said auxiliary flotation apparatus.

4. Apparatus for preparing waste paper for reuse in a paper machine comprising means for pulping the waste paper to form a pulp suspension, means for thickening the pulp suspension thereby separating waste water from the thickened pulp suspension, means for reacting the thickened pulp suspension with de-inking chemicals and thereafter thinning the suspension, and means for separating ink particles from the suspension by flotation; the improvement comprising means for introducing de-inking chemicals in said pulping means, auxiliary means for subsequently independently processing the waste water by separating by flotation ink particles from the water yielded by said thickening means, and means for reintroducing clean water from said auxiliary separating means into the apparatus.

4,360,403

METHOD OF CHARGING COKE OVENS WITH COAL

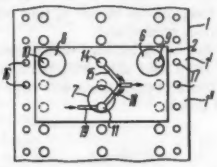
Adolf N. Silka, ulitsa Kostomirovskaya, 5/7, kv. 15; Alexandr N. Minasov, ulitsa Ivanova, 12/16, kv. 59; Nikolai K. Kulakov, ulitsa Akademika Pavlova, 132, kv. 223; Evgeny P. Likhogub, ulitsa Slinko, 2a, kv. 11; Gersh A. Dorfman, ulitsa Dmitrievskaya, 20, kv. 10, all of Kharkov; Alexandr A. Azimov, ulitsa Oktyabrskoi revoljutsii, 25, kv. 11, Slavyansk Donetskoi oblasti; Vladimir M. Davydenko, ulitsa Oktyabrskoi revoljutsii, 45/9, kv. 5, Slavyansk Donetskoi oblasti; Gennady N. Marapulets, ulitsa Lyzenko, 40, Slavyansk Donetskoi oblasti; Valentin A. Shestakov, ulitsa Marochnaya, 34, kv. 11, and Nikolai F. Gromov, ulitsa Promyshlennaya, 74, kv. 2, both of Kemerovo, all of U.S.S.R.

Division of Ser. No. 156,376, Jun. 4, 1980, abandoned. This application May 14, 1981, Ser. No. 263,401

Claims priority, application U.S.S.R., Nov. 17, 1975, 2320862

Int. Cl.³ C10B 31/04, 45/00

U.S. Cl. 202—263 2 Claims

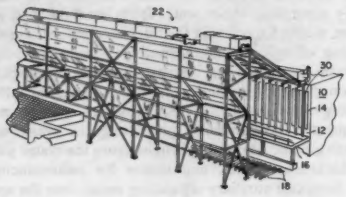


1. A coal-charging machine comprising a frame with undercarriages; hoppers for containing a coal charge, mounted on said frame, the number of the hoppers being equal to the number of the charging holes of a coking chamber; coal feed devices located in the upper part of said hoppers; coal discharging devices located in the lower part of said hoppers, The centers of the discharging holes of said coal discharging devices of the extreme hoppers for charging a coking chamber, being displaced, in the direction of movement of the coal-charging machine relative the centers of the discharging holes of the coal discharging devices of the middle hopper for completely charging another coking chamber by a distance equal to the distance between the longitudinal axes of a coking chamber being charged and another coking chamber being completely charged; a means for withdrawing coke-oven gases from a coking chamber through its middle charging holes, located in the same row with the extreme hoppers and mechanically connected with each middle hopper, and a blowing device communicating through said middle hoppers with another coking chamber.

4,360,404
APPARATUS FOR CONTROL OF COKE OVEN EMISSIONS

Michael J. Kozy, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 18, 1982, Ser. No. 340,234
Int. Cl.³ C10B *33/00, 39/00*
U.S. Cl. 202—263 5 Claims



1. Enclosure and exhaust apparatus for controlling coke-side emissions during a push in the operation of a coke oven battery comprising,

an exhaust duct extending longitudinally of the battery at an elevation above the top of the coke oven exit openings and having its exhaust inlet means located at least as far removed from the coke-side face of said battery as the outer boundary of the receiving zone for the pushed coke,

roof enclosure means bridging the space between the near side of said exhaust duct inlet means and the coke-side face of said battery,

outer enclosure means communicating with the far side of said exhaust duct inlet means and including a longitudinally extending side wall portion projecting downwardly at a location beyond said outer boundary of said receiving zone for the pushed coke,

essentially vertical partition wall means disposed between said face of said battery and said side wall portion at a location at least as far removed from the coke-side of said battery as the said outer boundary of the receiving zone for the pushed coke and having its upper edge portion supported in spaced rotation to said roof enclosure means to provide a longitudinal throat at said near side of said exhaust duct inlet means, and

a longitudinally extending inclined wall projecting angularly downwardly from said side wall portion to a position adjacent and spaced below the lower edge portion of said partition wall means.

4,360,405
PROCESS FOR FRACTIONATING CLOSE BOILING COMPONENTS OF A MULTI-COMPONENT SYSTEM

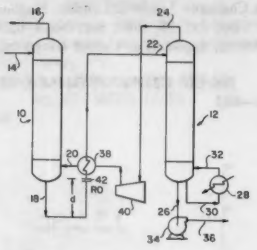
Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 148,977, May 12, 1980, Pat. No. 4,315,802. This application Jul. 8, 1981, Ser. No. 281,536
Int. Cl.³ B01D *3/06*
U.S. Cl. 203—24 5 Claims

1. In a process for fractionating close-boiling components of a multi-component system wherein such multi-component system is sequentially passed through at least two fractionation columns operating in series at the same or like pressures and wherein a higher boiling component of said multi-component system is withdrawn as a liquid from a last fractionation column and wherein the lower boiling component is separated as a vapor from a fractionation column, the improvement comprising:

(a) withdrawing a liquid bottom stream from one of said columns in series except the last of said columns and effecting expansion of said liquid bottom stream at a liquid head of a height sufficient to eliminate the requirement of a pump to pass the resulting liquid-vapor mixture to the next fractionation columns and to eliminate the liquid surge requirements in the bottom of said one column immediately preceding said next column;

(b) compressing a vapor stream withdrawn from an upper portion of said next fractionation column; and

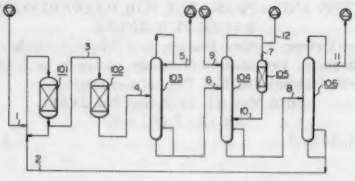


(c) introducing the compressed vapor stream of step (b) into a lower portion of said fractionation column immediately preceding said next fractionation column.

4,360,406
PROCESS FOR THE PREPARATION OF TERTIARY BUTYL ALCOHOL

Minoru Ikeda, Hiroshima; Kazuya Okada, Otake; Hiroshi Matsumura, Sayama, and Takeichi Tachihata, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 91,246, Nov. 2, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 282,163
Claims priority, application Japan, Nov. 6, 1978, 53-136538
Int. Cl.³ B01D *3/34, 3/40*
U.S. Cl. 203—32 4 Claims



1. In a process for preparing tertiary butyl alcohol from isobutylene comprising reacting isobutylene or a hydrocarbon mixture containing isobutylene with an aqueous solution of an aliphatic carboxylic acid having from 1 to 6 carbon atoms in the presence of a solid, acidic ion-exchange resin as a catalyst, to produce an aqueous reaction mixture of a major amount of tertiary butyl alcohol and a minor amount of the tertiary butyl ester of the carboxylic acid,

the improvement comprising the steps of:

(1) subjecting said reaction mixture to distillation to remove unreacted isobutylene or hydrocarbon mixture therefrom;

(2) supplying the treated reaction mixture of step (1) to a distillation column and passing water from the top to the bottom of said distillation column to remove said tertiary butyl ester of the carboxylic acid, wherein the amount of water used for removing the ester in step (2) is less than the sum of the amount of water used for converting said isobutylene into tertiary butyl alcohol and the amount of water contained in the tertiary butyl alcohol product;

(3) contacting the distillate obtained from the ester removal column with a strongly acidic ion-exchange resin to hydrolyze said tertiary butyl ester in the distillate; and thereafter

(4) returning said hydrolyzed liquid to the distillation column of step (2).

4,360,407

PROCESS FOR REMOVING GLYCERINE

Robert L. Reierson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 22, 1982, Ser. No. 360,251
Int. Cl.³ B01D 3/34; C07C 7/20
U.S. Cl. 203—34 9 Claims

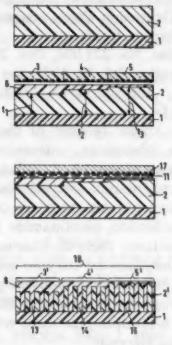
1. A process for distillatively separating glycerine from a mixture comprising glycerine and glycerine-based acetal or ketal reaction products comprising contacting the mixture with a borate ester-forming compound and thereafter distillatively removing the glycerine-based acetal or ketal reaction products.

4,360,408

INFORMATION CARRIERS, METHOD OF FORMING AND COPYING SAID CARRIERS

Roland Moraw, and Renate Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 64,645, Aug. 7, 1979, Pat. No. 4,294,913, which is a division of Ser. No. 861,491, Dec. 16, 1977. This application Apr. 16, 1980, Ser. No. 140,733
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657246
The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.
Int. Cl.³ C25D 1/00
U.S. Cl. 204—4 1 Claim



1. A process for reproducing the information stored on an information carrier for use in zero order diffraction color projection which comprises the steps of:

mounting a recording layer on a carrier;

exposing said recording layer through individual color separation originals with energy density equal to that required to obtain individual projection colors to form relief part-images, each relief-part-image corresponding to a different projection color and adjoining the other ones without overlap and having a depth corresponding to one of the particular projection colors;

exposing said recording layer to a grating pattern without intervening development to provide a structure in which the recording layer is exposed through to said carrier;

developing said exposed recording layer;

coating said recording layer with a thin, electrically conductive layer by vapor-depositing said conductive layer on the surface of the recording layer carrying the relief-part-images;

electroplating a metal coating on said electrically conductive layer so that said metal coating represents the negative relief-part-images of said recording layer; and

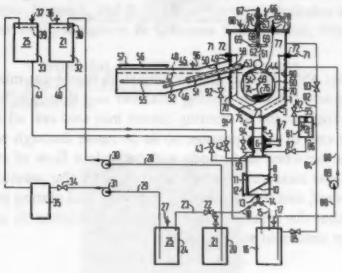
separating said metal coating from said recording layer to form a matrix.

4,360,409

APPARATUS FOR THE GALVANIC DEPOSITION OF ALUMINUM

Klaus Stoeger, Nuremberg; Siegfried Birkle, Hoechstadt, and Johann Gehring, Spardorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,490
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023129
Int. Cl.³ C25D 5/00, 17/18
U.S. Cl. 204—14 N 16 Claims



1. Apparatus for the galvanic deposition of aluminum onto work pieces from an aprotic, organo-aluminum electrolyte which is free of oxygen and water, comprising:

a heatable, gas-tight galvanizing tank;

a rotatable galvanizing drum mounted inside said galvanizing tank, including mounting means therefore;

means for supplying said galvanizing tank with an inert gas;

an electrolyte feed container and associated conduit means for supplying electrolyte to said galvanizing tank;

a pair of further containers each for the storage of inert fluid;

first airlock means associated with said galvanizing tank;

transport means for conveying said work pieces into the interior of said galvanizing tank via said first airlock means;

a discharge container;

means for supplying said discharge container with inert fluid;

said discharge container being arranged gravitationally below galvanizing tank; and

second airlock means interconnecting said discharge container to said galvanizing drum and adapted for passage therethrough of said work pieces after galvanization.

4,360,410

ELECTROPLATING PROCESSES AND EQUIPMENT UTILIZING A FOAM ELECTROLYTE

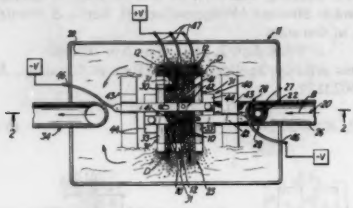
Ivan M. Fletcher, Carmel, and Richard H. Meier, Indianapolis, both of Ind., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,333
Int. Cl.³ C25D 5/08, 17/00
U.S. Cl. 204—23 13 Claims

1. An improved electroplating process of the type wherein an article to be plated is mounted in an electroplating cell as a cathode, an anode is mounted in the cell in spaced relationship to the cathode to provide therebetween a passage extending in its end-to-end direction transversely of the spacing between such electrodes, a liquid electrolyte is circulated in the cell between the anode and cathode, and a plating potential is applied between anode and cathode so as to plate a metal from

the electrolyte onto a surface of the article, wherein the improvement comprises:

pumping the liquid electrolyte under pressure into a chamber outside the cell while simultaneously injecting into said liquid in said chamber an inert gas under pressure so that the gas mixed with the liquid in the chamber to form therein a a pressurized mixture of such gas plus such liquid constituted by volume of the mixture from about 8% to



about 45% of such gas, forcing such liquid-gas mixture by pressure from the mixing chamber and through fluid conducting means to opening means into said cell adjacent to one end of such passage so as to cause through said passage between said anode and cathode a flow of such liquid-gas mixture impelled to so flow by the pressurization thereof, and simultaneously applying said plating potential so that the metal is plated from such mixture in said passage onto said surface of the article.

4,360,411

ALUMINUM ELECTRICAL CONTACTS AND METHOD OF MAKING SAME

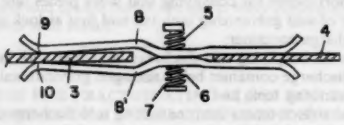
Michel Ladet, Grenoble; Jacques Lefevre, Voiron, and Jos Patrie, Grenoble, all of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Division of Ser. No. 25,488, Mar. 30, 1979, abandoned. This application Aug. 19, 1980, Ser. No. 179,434

Claims priority, application France, Mar. 31, 1978, 78 10333

Int. Cl.³ C25D *5/44*

U.S. Cl. 204—33 **4 Claims**



4. A method for the production of a nickel plated aluminum substrate electrical contact member by electrodeposition of a nickel electrical contact layer directly on a surface of an aluminum substrate by the sequential manipulative steps of:

(a) preparing the surface of the aluminum substrate by;

(i) depositing a thin layer of nickel on the surface of the substrate by chemical displacement in an acidic aqueous solution comprising.

HF: 5 to 50 g/l

H_3BO_3: 10 to 60 g/l

$NiCl_2.6H_2O$: 50 to 500 g/l

(ii) removing the thin layer of nickel by dissolution wherein the surface of the substrate contiguous with the removed nickel is physically modified and oxide-free; and

(b) electrodepositioning a nickel electrical contact layer on the prepared surface of the aluminum substrate whereby resistance to mechanical and or thermal stressing of the nickel contact layer-aluminum substrate bond is increased.

4,360,412

TREATMENT OF PERMIONIC MEMBRANE

Bernard A. Maloney, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 17, 1980, Ser. No. 207,594

Int. Cl.³ C25B *1/34*

U.S. Cl. 204—98 **6 Claims**

1. In a method of operating an electrolytic cell having an anolyte compartment, a catholyte compartment, and a cation selective permionic membrane therebetween, wherein said cation selective permionic membrane is a fluorocarbon resin having cation selective functional groups, said cation selective functional groups being in the ester or hydrogen acid form prior to electrolysis and in the alkali metal salt form during electrolysis, which method comprises feeding alkali metal chloride brine to the anolyte compartment, passing an electrical current through the cell, and evolving chlorine, the improvement comprising:

(a) feeding alkali metal chloride brine to the anolyte compartment prior to the passage of current through the cell;

(b) feeding aqueous alkali metal hydroxide to the catholyte compartment prior to the passage of current through the cell;

(c) maintaining the concentration of said alkali metal hydroxide in the catholyte compartment between about 8 to 12 mole percent, basis moles of water, until said functional groups are substantially hydrolyzed in situ to the alkali metal salt; and

(d) thereafter commencing electrolysis.

4,360,413

CREATINE KINASE ISOENZYME ELECTROPHORETIC TECHNIQUE AND IMPROVED CREATINE KINASE ISOENZYME REAGENT FOR USE THEREIN

Robert T. Y. Lee, Oceanside, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 221,096, Dec. 29, 1980, abandoned. This application Jul. 20, 1981, Ser. No. 284,871

Int. Cl.³ G01N *27/00*

U.S. Cl. 204—180 G **15 Claims**

1. A creatinine kinase reagent of the type comprising a buffer, creatinine phosphate, adenosine diphosphate, D-glucose, hexokinase, glucose-6-phosphate dehydrogenase, a thiol compound, magnesium ion, adenosine monophosphate, and a coenzyme selected from the group consisting of nicotinamide adenine dinucleotide, nicotinamide adenine dinucleotide phosphate and mixtures thereof, characterized in that said reagent further comprises an enzyme selected from a group consisting of phosphogluconate dehydrogenase and phosphogluconate dehydrogenase (decarboxylating) in an amount sufficient to react 6-phosphogluconate with said coenzyme in the presence of said enzyme.

4,360,414

METHOD OF PRODUCING STRUCTURES COMPRISED OF LAYERS CONSISTING OF SILICIDES OR SILICIDE-POLYSILICON BY REACTIVE SPUTTER ETCHING

Willy Beinvogl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 19, 1981, Ser. No. 322,887

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045922

Int. Cl.³ C15C *15/00*

U.S. Cl. 204—192 E **8 Claims**

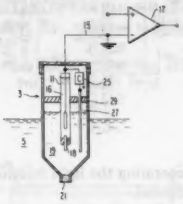
1. In a method of producing structures comprised of layers consisting of silicides or double layers of silicide-polysilicon on substrates containing integrated semiconductor circuits by reactive sputter etching with sulfur hexafluoride (SF_6) as the etching gas with the use of a photosensitive resist mask, the improvement comprising wherein:

said etching process is accomplished in two steps, with a first etching step being carried out with a relatively high frequency power of more than about 0.3 W/cm^2 at relatively high etching rates, and a second etching step being carried out with a relatively lower high frequency power of less than about 0.2 W/cm^2 at relatively lower etching rates.

4,360,415
NOISE SUPPRESSING BYPASS FOR REFERENCE ELECTRODE

Donald P. Brezinski, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,457
Int. Cl.^{3} G01N *27/30*
U.S. Cl. 204—195 F 5 Claims



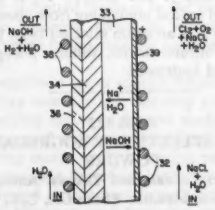
1. In a reference electrode comprising a housing containing an electrochemical half-cell including a half-cell electrolyte, a junction electrolyte and a reference junction allowing ionic conduction between said junction electrolyte and an external sample, and an internal junction or barrier allowing ionic conduction between said half-cell electrolyte and said junction electrolyte, the electrochemical half-cell being electrically connectable to an external measuring means, the improvement characterized by:

a capacitor means electrically connected between said half-cell and an electronic conductor at least partially immersed in said junction electrolyte, whereby high frequency a.c. noise signals are suppressively bypassed around said internal junction or barrier and through the low a.c. impedance path presented by said capacitor and said electronic conductor.

4,360,416
ANODE CATALYSTS FOR ELECTROLYSIS OF BRINE

Craig R. Davidson, Hampstead, N.H., and John M. Sedlak, Andover, Mass., assignors to General Electric Company, Wilmington, Mass.

Division of Ser. No. 145,936, May 2, 1980, abandoned. This application Apr. 27, 1981, Ser. No. 258,126
Int. Cl.^{3} C25B *9/00, 11/06, 11/08, 13/08*
U.S. Cl. 204—266 5 Claims



1. Apparatus for the evolution of halogen gas comprising:

(a) a catalytic cathode;

(b) a catalytic halogen-evolving anode stabilized against corrosion in neutral or acidic media at anodic potentials in excess of 1.4 V comprising a catalyst of ruthenium oxide and manganese oxide;

(c) a solid polymer electrolyte ion transporting membrane disposed between and separating the catalytic cathode and the catalytic halogen evolving-anode, at least one of the cathode and anode being bonded to the respective surface of the membrane;

(d) means for supplying a medium to said anode for evolving halogen in an electrolysis reaction at the stablized anode; and

(e) means for providing a direct current potential between the cathode and anode in excess of 1.4 V for evolving halogen at the anode without corrosion of the anode catalyst.

4,360,417
DIMENSIONALLY STABLE HIGH SURFACE AREA ANODE COMPRISING GRAPHITIC CARBON FIBERS

Arie Reger, Summit, and B. Sheldon Sprague, Berkeley Heights, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,533
Int. Cl.^{3} C25B *11/06, 11/12;* H01M *4/48*
U.S. Cl. 204—290 R 8 Claims

1. A dimensionally stable anode of a relatively high surface area of at least 3,000 cm^2/cm^3 capable of extended usage in an electrolytic reaction in which oxygen is evolved comprising a carbonaceous fibrous material which exhibits a predominantly graphitic x-ray diffraction pattern and contains at least 95 percent carbon by weight which bears a coating of a mixed crystal material consisting essentially of ruthenium oxide and titanium oxide.

4,360,418
ELECTROPHORESIS AND STAINING APPARATUS

Tipton L. Golias, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Jun. 12, 1981, Ser. No. 273,147
Int. Cl.^{3} G01N *27/26*
U.S. Cl. 204—299 R 23 Claims

1. In an automated electrophoresis and staining apparatus;

an elongated base;

an elongated platform spaced from mounted on and overlying said base;

an electrophoresis chamber adapted to contain a buffer solution mounted upon said platform at one end thereof;

and a series of vats mounted upon said platform arranged in a row and aligned with said chamber, adapted to contain respectively a liquid stain and a series of processing solutions;

a plate holder rack including a horizontal open frame within said electrophoresis chamber and at one end a support arm projecting outwardly of said chamber;

said frame adapted for supporting one or a plurality of upright electrophoresis media plates onto which has been applied a sample for electrophoretic fractionization;

said plate or plates being nested within said chamber within an electrophoretic circuit between a cathode and anode for a predetermined period;

and a power operated lift and transfer assembly upon said base adapted to progressively lift, transfer and lower said

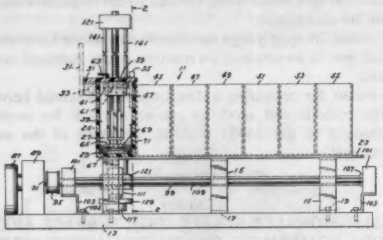


plate holder and plates from said chamber and into each of said underlying vats successively for a predetermined period in a linear stepping motion;

whereby said plates in an upright position are immersed into the solutions within said vats.

4,360,419

CATALYTIC DEWAXING

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 22, 1980, Ser. No. 219,129

Int. Cl.³ C10G *11/05, 47/18*

U.S. Cl. 208—111 **7 Claims**

1. A dewaxing process, comprising contacting under catalytic dewaxing conditions, a hydrocarbonaceous feed which comprises normal and slightly-branched chain hydrocarbons and which has a feed nitrogen content of less than about 50 ppmw and a feed sulfur content of less than about 50 ppmw with a catalyst which comprises a hydrogenation component and a zeolite having a mol ratio of an oxide selected from silicon oxide, germanium oxide, and mixtures thereof to an oxide selected from aluminum oxide, gallium oxide and mixtures thereof greater than about 5:1, and having the X-ray diffraction lines of Table I.

4,360,420

DISTILLATION AND SOLVENT EXTRACTION PROCESS FOR REREFINING USED LUBRICATING OIL

Laird C. Fletcher, Natchitoches; Harold J. Beard, Baton Rouge, and Richard O'Blasny, Natchitoches, all of La., assignors to Delta Central Refining, Inc., Natchitoches, La.

Filed Oct. 28, 1980, Ser. No. 202,018

Int. Cl.³ C10M *11/00;* **C10G** *7/00, 21/16.*

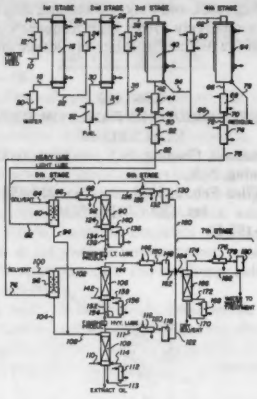
U.S. Cl. 208—184 **29 Claims**

1. A method of rerefining used oil containing lubricating oil comprising:

(a) removing from the used oil a volatile forecut to provide a resulting oil containing lubricating oil;

(b) evaporating the resulting oil in an evaporator unit at reduced pressure, greater than about 2.0 millimeters of mercury, to form heavy and light fractions, with a portion of said light fraction recycled and mixed into the resulting oil prior to the resulting oil entering the evaporator unit, in a quantity effective for lowering the vaporization temperature of the resulting oil to reduce the tendency of fouling, coking and cracking of the resulting oil during evaporation;

(c) mixing the light fraction not recycled into the resulting oil with an effective amount of tetrahydrofurfuryl alcohol for removing impurities from the light fraction; and



(d) thereafter separating the light fraction from the tetrahydrofurfuryl alcohol.

4,360,421

METHOD FOR TREATING MERCAPTANS CONTAINED IN A SOUR PETROLEUM DISTILLATE

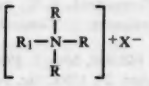
Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 169,553, Jul. 17, 1980, Pat. No. 4,320,029. This application Dec. 17, 1981, Ser. No. 332,053

Int. Cl.³ C10H *29/00*

U.S. Cl. 208—207 **10 Claims**

1. A method of treating a mercaptan-containing sour petroleum distillate which comprises contacting said distillate at oxidation conditions with a catalytic composite comprising a carrier material, a metal chelate oxidation catalyst, a substituted ammonium compound, and a linear ionic compound containing from about 9 to about 24 carbon atoms and having an anionic portion, wherein said anionic portion is selected from the group consisting of sulfonate, sulfate and carboxylate, said substituted ammonium compound being represented by the structural formula:



where R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R_1 is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, and X is an anion selected from the group consisting of halide, nitrate, nitrite, sulfate, phosphate, acetate, citrate, tartrate and hydroxide.

4,360,422

PROCESS FOR SELECTIVELY AGGREGATING COAL POWDER

Naoki Oka; Nobuo Tanaka, and Takashi Ando, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1981, Ser. No. 292,850

Claims priority, application Japan, Aug. 18, 1980, 55/112658

Int. Cl.³ B03B *1/00*

U.S. Cl. 209—5 **5 Claims**

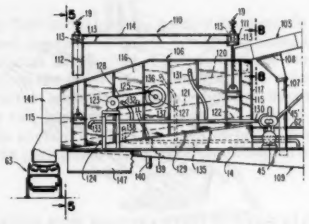
1. A process for removing ash from raw coal comprising

adding mineral oil to a slurry composed of a coal powder and water, granulating the coal by stirring to form granules, and separating the resulting coal granules by a screen, wherein the improvement comprises granulating the coal using a mineral oil mixture consisting from 0.1 to 10% by weight of a heavy fraction having a boiling point of at least 330° C. and from 90 to 99.9% by weight of a light fraction having a boiling point of 230° C. or less, heating the coal granules separated by the screen to evaporate and recover almost all of the light fraction, and reusing the recovered light fraction for granulation of additional coal granules.

4,360,423
METHOD AND APPARATUS FOR SEPARATING MATERIALS OF LIGHTER AND HEAVIER SPECIFIC GRAVITIES AND CLEANING THE MATERIAL OF LIGHTER SPECIFIC GRAVITY

Kidd S. Fugate, Hazard, Ky., assignor to River Processing, Inc., Hazard, Ky.

Filed Apr. 8, 1981, Ser. No. 252,054
Int. Cl.³ B03B 5/36
U.S. Cl. 209—17 **31 Claims**



1. A method for separating and cleaning a material of lighter specific gravity from a material of heavier specific gravity including:

receiving materials of lighter specific gravity and heavier specific gravity;

separating particles of the materials from each other by vibrating the received materials;

removing separated particles below a selected size from the received materials;

directing the remaining materials initially to the top of a bath of a medium having a selected specific gravity to cause the material of lighter specific gravity to float to the top of the medium while the material of heavier specific gravity falls to the bottom of the bath of the medium;

supplying medium to the bath from a reservoir;

directing the material of lighter specific gravity floating on top of the bath of the medium to receiving means;

collecting some of the medium during travel of the medium and the material of lighter specific gravity to the receiving means from the bath of the medium;

returning the collected medium to the reservoir;

vibrating the receiving means to vibrate the particles of material therein to separate the particles of material from each other;

applying compressed air at spaced longitudinal portions of the receiving means to the vibrating particles of material in the receiving means to remove medium therefrom;

applying a spray of water at spaced longitudinal portions of the receiving means to the vibrating particles of material to remove medium therefrom in the receiving means after the compressed air has been initially applied thereto;

collecting medium removed from the vibrating particles of material in the receiving means at at least the first spaced longitudinal portion of the receiving means to which the compressed air is applied;

returning the collected medium removed from the vibrating particles of material in the receiving means to the reservoir;

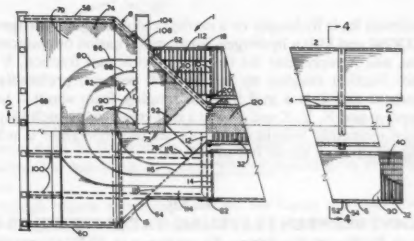
removing from the bottom of the bath of the medium the material of heavier specific gravity that falls to the bottom of the bath of the medium;

and applying compressed air to the bath of the medium above its bottom to create turbulence therein to aid in separating the material of lighter specific gravity from the material of heavier specific gravity.

4,360,424
SLUICE BOX

Norman A. Pearson, 4862 Bessborough Dr., Burnaby, British Columbia, Canada, and Gary W. Crawford, North Vancouver, Canada, assignors to Norman Anthony Pearson, Burnaby, Canada

Filed Apr. 20, 1981, Ser. No. 255,779
Int. Cl.³ B03B 7/00
U.S. Cl. 209—44 **22 Claims**



1. A sluice box apparatus for recovering heavy material, such as gold, the apparatus comprising:

(a) a fine recovery channel and a coarse recovery channel, the recovery channels each having a receiving end, riffles, and matting for collecting fines of said material;

(b) a hopper adjacent the receiving ends of the channels having a receiving end for aggregate, a wall for retaining the aggregate, a discharge end adjacent the receiving ends of the channels, a bottom, an open top, a perforated plate extending substantially across the hopper near the discharge end, the plate being spaced-apart from the bottom, a coarse material discharge opening in the wall adjacent the coarse recovery channel for a flow of water and aggregate passing over the perforated plate to the coarse recovery channel, the coarse material discharge opening being above the perforated plate when the apparatus is positioned for use, and a fine material discharge opening means in the wall between the bottom and the perforated plate and adjacent the fine recovery channel, the fine material discharge opening means allowing a flow of water and fine material passing through the perforated plate to enter the fine recovery channel;

(c) water distributing means near the top and the discharge end of the hopper for washing fines from the aggregate; and

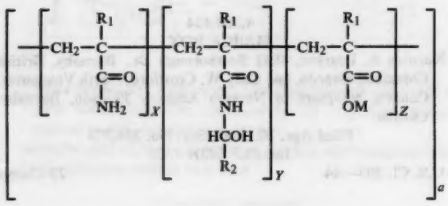
(d) means for adjusting the fine material discharge opening means to a size which limits the flow of water to the fine recovery channel to such an extent that water recirculates upwardly through the perforated plate to aggregate on the perforated plate and washes additional fines from the aggregate.

4,360,425
LOW MOLECULAR WEIGHT COPOLYMERS AND TERPOLYMERS AS DEPRESSANTS IN MINERAL ORE FLOTATION

Sim K. Lim, Stamford, and Richard M. Goodman, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 14, 1981, Ser. No. 301,850
Int. Cl.³ B03D 1/14
U.S. Cl. 209—167 **11 Claims**

1. A process for concentrating nonsulfide mineral values in a flotation system which comprises adding to the flotation system, as a selective depressant, an effective amount of a copolymer or a terpolymer or water soluble salts thereof of the general structure:

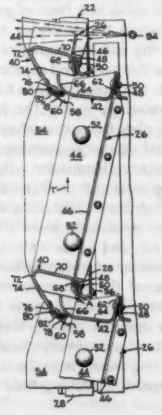


wherein R_1 is hydrogen or a methyl radical, R_2 is hydrogen or COOM and M is a hydrogen, alkali metal cation or ammonium ion, and X represents the residual percent mol fraction, Y is a mol fraction ranging up to about 50 percent, preferably 25 percent and Z is a mol fraction ranging from about 0 to 45 percent and X, Y, Z and a have a numerical value such that the total molecular weight of copolymer or terpolymer is within the range from about 200 to 500,000.

4,360,426
JOINT BETWEEN TRAVELING WATER SCREEN TRAYS

Jack D. Wetzel, Souderton, Pa., assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 2, 1981, Ser. No. 239,869
Int. Cl.³ B01D 33/32
U.S. Cl. 210—160 **11 Claims**

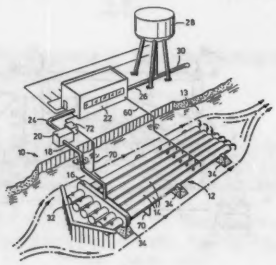


1. In a joint between adjacent traveling water screen trays that are connected for articulation about an axis extending transversely of a path along with the trays travel seriatim in a vertical loop, each tray having a transverse member extending parallel and adjacent to the axis with one member leading the other member in the direction of tray travel, the improvement comprising the trailing member having a cross-sectional shape that extends linearly outward of the loop and curves about the axis of articulation both outwardly and forwardly relative to the path of travel, the leading member having a cross-sectional shape that extends outwardly of the loop beyond the curved portion of the trailing member to an outer edge from where an extension projects rearwardly towards the curved portion, and a flexible seal mounted on the leading member for continuous overlapping and contact with the curved portion of the trailing member on the opposite side thereof from the axis of articulation as the traveling water screen trays travel in the vertical loop.

4,360,427
SUBMERSIBLE WATER CLARIFIERS

Edward S. Posgate, 211 Lime Kiln Rd., Ancaster, Ontario, Canada (L9G 3A9)

Filed Apr. 6, 1981, Ser. No. 251,350
Int. Cl.³ B01D 21/01
U.S. Cl. 210—170 **3 Claims**



1. In a submersible water clarifier for use in the flowing stream, said clarifier having at least one longitudinally elongated conduit which has an upstream end and a downstream end, means for opening and closing the upstream end of each conduit, the downstream end of each conduit being opened, a settling chamber extending inwardly from the downstream end, the settling chamber having a floor toward which sediment settles and an upper portion in which clarified water accumulate in use, the improvement comprising a sediment removal passage opening through said floor, foundation means for supporting each of said elongated conduits above the bed of a stream to permit substantially uninterrupted flow of stream water below the settling chamber in the downstream direction, said sediment removal passage having a discharge orifice opening in said downstream direction through which the sediment will be extracted from the floor of said chamber by the negative pressure generated by the stream water passing by the discharge orifice in use, and outlet passage means in the upper part of each conduit through which clarified water is withdrawn.

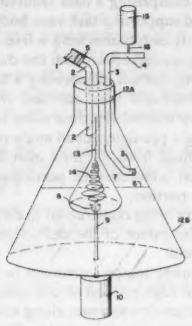
4,360,428
INVERTED VORTEX, PARTICLE SEPARATION CHAMBER

John E. Comparetto, P.O. Box 408, and Robert L. Brand, P.O. Box 214 both of Chincoteague, Va. 23336

Filed May 1, 1980, Ser. No. 145,556
Int. Cl.³ B01D 19/00
U.S. Cl. 210—188 **2 Claims**

1. An apparatus for separating a particle-laden effluent stream comprising a trapezoidal or conical shaped chamber having an upper gaseous portion and a lower liquid portion, a liquid-gas interphase being formed between the upper and lower portions, a liquid inlet within the upper gaseous portion

which supplies particle-laden liquid for the apparatus for separation, a gas outlet within the upper gaseous portion which exerts a vacuum pressure so as to remove gas and liquid vapor, an inverted funnel means which is partially submerged in the lower liquid portion, and partially suspended in the upper gaseous portion, an impeller means within the funnel means, the impeller means forming a fluid vortex within the funnel



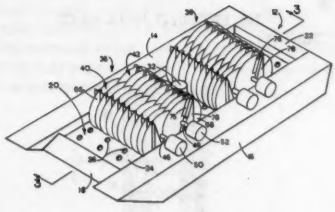
means, the fluid vortex causing particulate matter in the liquid in the funnel means to be driven downward along an internal downward cant of the funnel means into the lower liquid portion below the funnel means and the fluid vortex causing particulate-free liquid to be driven upward into the upper portion of the inverted funnel means, and a liquid outlet located in the upper portion of the inverted funnel means which removes the particulate-free liquid from the apparatus.

4,360,429

APPARATUS FOR RECOVERING FLUIDS FLOATING ON WATER

David E. Morris, North Vancouver, Canada, assignor to Morris Industries Ltd., North Vancouver, Canada

Filed Dec. 16, 1980, Ser. No. 216,427
Int. Cl.³ E02B *15/04*
U.S. Cl. 210—242.3 **21 Claims**



1. An apparatus for recovering fluids floating on a body of water, the apparatus comprising:

(a) two rows of discs, the discs of each said row being spaced-apart coaxially along a shaft means;

(b) means for supporting the rows of discs so each of the discs has a lower portion in contact with the fluid and an upper portion above the surface of the fluid;

(c) motor means coupled to the shaft means for rotating the shaft means and the discs; and

(d) wiping means contacting the upper portions of the discs for wiping the fluid carried upwards by the discs as the discs rotate and for collecting the fluid wherein the wiping means comprises resilient wiper blades contacting the sides of the discs and a collector channel between adjacent discs of each said row, the wiper blades being mounted on the channels to deflect the fluid into the channels, and wherein each said disc has a top rotational position, each said wiper blade extending radially from near the center of an adjacent said disc to near the top rotational position;

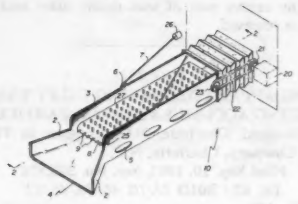
(e) the shaft means for the rows of discs being parallel and spaced-apart a distance such that the discs of said two rows interdigitate, the two rows of discs being contra-rotatable by the motor means and adjacent discs being spaced-apart a distance such that the fluid between the adjacent discs is raised towards the wiping means by a pumping action which lifts the fluid an initial distance towards the wiping means.

4,360,430

SPILL RETRIEVAL MECHANISM FOR REMOVING A SPILLED SUBSTANCE FROM A LIQUID SURFACE

Royd H. Ellis, 1200 N. Capital St., Washington, D.C. 20001

Filed May 5, 1981, Ser. No. 260,707
Int. Cl.³ B01D *17/02;* F02B *15/04*
U.S. Cl. 210—242.3 **9 Claims**



1. A spill retrieval mechanism for removing a spilled substance such as oil from a liquid surface such as water and placing the substance in a reservoir comprising, in combination:

trough means extending between the liquid and said reservoir, said trough is formed with a bottom surface having a pair of spaced parallel upwardly extending side walls provided with a clearance from said conveyor means and a plurality of outlets below said conveyor means to allow water to pass therethrough, an inlet chute having a leading edge which flares outwardly, and complementarily formed diverging outwardly flared side walls which communicate and extend to said parallel walls,

conveyor means operatively disposed on said trough and driven to cause the oil to be carried on a top face thereof,

angulation means operatively connected to said trough to vary the angle of attack of said trough to the liquid,

retention means on said conveyor for holding the substance on said top face while allowing the liquid to run off,

and removal means extending between said conveyor and said reservoir to place the substance in said reservoir.

4,360,431

SELF-UNLOADING CENTRIFUGE

Frank Little, Au Gres, Mich., assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed May 1, 1981, Ser. No. 259,435
Int. Cl.³ B01D *33/06;* B04B *3/00*
U.S. Cl. 210—369 **18 Claims**

1. A self-unloading, centrifuge, comprising:

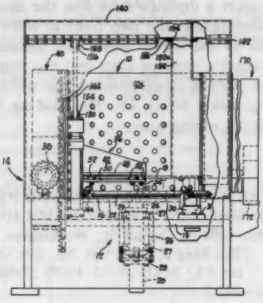
(a) a support base;

(b) an upstanding, open top drum including a perforate cylindrical wall supported for rotation about a substantially vertical axis;

(c) drive means for imparting rotation to said drum including releasable coupling means for operatively connecting said drum to said drive means;

(d) drum unloading means including drum tilting apparatus

engageable with said drum and operative to pivot said drum about a substantially horizontal axis, laterally spaced



from the center axis of said drum, after said coupling means is released.

4,360,432

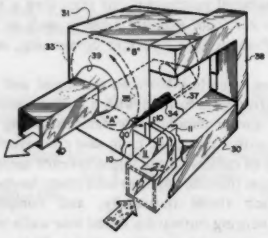
FILTERING APPARATUS HAVING INLET VANES FOR PREVENTING ACCUMULATION OF PARTICULATES

John P. Kieronski, Charlotte, N.C., assignor to The Terrell Machine Company, Charlotte, N.C.

Filed Sep. 10, 1981, Ser. No. 300,871

Int. Cl.³ B01D *33/10, 46/26, 46/42*

U.S. Cl. 210—402 **17 Claims**



1. An apparatus comprising a fluid duct having an inlet and outlet and a vane positioned in said duct for deflecting fluid as it moves therethrough and further for preventing the accumulation on the vane of particulate matter entrained in the fluid, and comprising:

(a) a vane body comprising a base secured to the inner wall of the duct and supporting said vane body within the duct;

(b) said vane body also comprising a free end opposite said base for being spaced-apart from the duct walls;

(c) said vane body further comprising a forward edge portion intermediate said base and said free end for being faced upstream toward the duct inlet, said forward edge portion having a pre-determined angle of incidence to the travel of the fluid from the duct inlet sufficient to overcome frictional adherence of particulate matter to said forward edge portion;

(d) said vane body being constructed to define a curve corresponding to the extent of the deflection to be applied to the moving fluid;

whereby as particulate matter entrained in the fluid impacts said angled forward edge portion of said vane body, the particulate matter continues downstream along said angled forward edge portion towards the duct outlet, clearing said angled forward edge portion and being deflected to a pre-determined extent by said vane body.

11. In a fluid filtration system including an elongate filter surface for filtering entrained particulate matter from a fluid as the fluid is passed from the upstream to the downstream side thereof, and a duct, having an inlet and an outlet, disposed at less than a right angle to said filter surface for conveying a fluid thereto, the combination therewith of a plurality of vanes positioned progressively laterally across and progressively longitudinally along an interior wall of the duct, each of said vanes comprising:

(a) a vane body comprising a base secured to the inner wall of the duct and supporting said vane body within the duct;

(b) said vane body also comprising a free end opposite said base for being spaced-apart from the duct walls;

(c) said vane body further comprising a forward edge portion intermediate said base and said free end for being faced upstream toward the duct inlet, said forward edge portion having a pre-determined angle of incidence to the travel of the fluid from the duct inlet sufficient to overcome frictional adherence of particulate matter to said forward edge portion;

(d) said vane body being constructed to define a curve corresponding to the extent of the deflection to be applied to the moving fluid;

whereby as particulate matter entrained in the fluid impacts said angled forward edge portion of said vane body, the particulate matter continues downstream along said angled forward edge portion towards the duct outlet clearing said angled forward edge portion and being deflected to a pre-determined extent by said vane body.

17. The combination according to claim **11**, wherein said elongate filter surface comprises a rotatably mounted drum having a filter medium positioned around the circumferential periphery of said drum and wherein said plurality of vanes positioned in said duct deflects the fluid so that the fluid is passed through said filter medium at substantially right angles to the axis of rotation of said drum.

4,360,433

FILTER ELEMENTS FOR GAS OR LIQUID

Brian Walker, Washington, and Kenneth Merrie, Durham, both of England, assignors to Process Scientific Innovations Limited, Durham, England

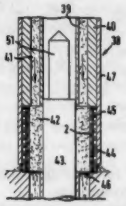
Division of Ser. No. 3,450, Jan. 15, 1979, Pat. No. 4,303,472.

This application Feb. 18, 1981, Ser. No. 235,473

Claims priority, application United Kingdom, Jan. 23, 1978, 02559/78

Int. Cl.³ B01D *29/16, 46/02*

U.S. Cl. 210—484 **2 Claims**



1. A fibrous filter element comprising a tubular wall consisting of a mass of elongated fibers compacted at substantially constant density throughout the length and thickness of the said tubular wall as a result of said fibers having been compacted progressively in a direction parallel to the central axis of said tubular wall from one end to the other end of said tubular wall during the fabrication of said tubular wall, a majority of said elongated fibers being oriented approximately in parallel to one another in a circumferential direction about the central axis of said tubular wall, a synthetic resin bonding said fibers together, and a tubular sheet of apertured material disposed external of said tubular wall adjacent the outer face of

said tubular wall for providing additional support for said bonded mass of circumferentially oriented fibers, the outer face of said tubular wall being joined to said sheet with some of said fibers penetrating through the apertures in said sheet and filling said apertures to present fiber surfaces substantially flush with the surface of said sheet remote from said wall.

4,360,434

AMPHOTERIC ION-PERMEABLE COMPOSITE MEMBRANE

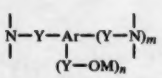
Takeyuki Kawaguchi; Hiroyoshi Minematsu, both of Iwakuni; Yuzuru Hayashi, Kyoto; Shigeyoshi Hara, and Fumio Ueda, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 15, 1981, Ser. No. 225,324
Int. Cl.³ B05D *3/10, 5/00*
U.S. Cl. 210—500.2 **25 Claims**

1. An amphoteric ion-permeable composite membrane having an NaCl and a sucrose rejection having the relation defined by the following equation:

$$2\times(\text{sucrose rejection in \%})-(\text{NaCl rejection in \%})\geqq 150$$

and an NaCl rejection of at most 40% and a sucrose rejection of at least 80%, said member composed of a microporous substrate, and supported on the substrate, a thin amphoteric ion-exchange film formed of an active amino group-containing polymer which has been interfacially crosslinked at least at the surface portion of the thin film, said membrane being produced by forming a thin layer comprising an active amino group-containing polymer containing 1.0 to 23 milliequivalents/g, as an amino equivalent, of an active amino group selected from primary and secondary amino groups and 0 to 18 milliequivalents/g, as an amino equivalent, of a tertiary amino group and/or an ammonium salt group per molecule with the total amino content thereof being in the range of 2.0 to 23 milliequivalents/g on the microporous substrate and then contacting the thin layer on the substrate interfacially with a polyfunctional aromatic compound to interfacially crosslink the thin layer, said polyfunction aromatic compound containing at least two functional groups selected from carbonyl halide groups, sulfonyl halide groups, carboxylic acid anhydride groups, sulfonic acid anhydride groups and derivative groups of carboxylic acids and sulfonic acids having equivalent reactivity to the aforesaid halide and anhydride groups; the interfacially crosslinked polymer zone of the thin film containing at least one structural unit of the formula



(I)

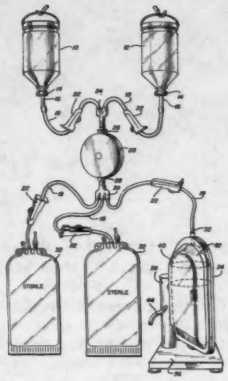
wherein Ar represents an aromatic ring, Y represents CO or SO_2 provided that (m+n+1) group Y bonded to the group Ar are identical or different, M represents an atom or atomic grouping capable of being split off as a cation, and m and n each represent an integer of 0 or more provided that m+n=1-3, said polymer zone further containing a structural unit of formula (I) in which m is not zero when it contains a structural unit of formula (I) in which m is zero, and further containing a structural unit of formula (I) in which n is not zero when it contains a structural unit of formula (I) in which n is zero, and additionally containing at least 0.5 milliequivalents/g, based on the dry crosslinked polymer, of an ammonium salt group as an anion-exchange group and at least 0.05 milliequivalents/g of the dry crosslinked polymer of the group -YOM in formula (I) as a cation-exchange group, the equivalent ratio of the ammonium salt group to the group -YOM being in the range of from 20:1 to 1:2.

4,360,435

PROCESS FOR STERILIZING AND TRANSFERRING A SOLUTION

David Bellamy, Kenilworth, and John L. Quick, Buffalo Grove, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 1, 1979, Ser. No. 90,235
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—636 **6 Claims**



1. A process for sterilizing a solution and thereafter transferring it to a solution container for storage, which comprises the steps of:

providing at least one solution container having an inlet;

providing a sterilizing filter capable of sterilizing a solution and having a maximum pore size of about 0.22 micron, said filter having an outlet;

providing flexible tubing connected to the inlet of said solution container and to the outlet of the sterilizing filter, to provide a fluid path between the filter and the solution container;

providing said sterilizing filter, flexible tubing and container as a pre-sterilized unit with a label indicating that said unit is sterile;

connecting a source of solution to be transferred to an inlet of said sterilizing filter;

sterilizing the solution by transferring it from the source, through the sterilizing filter and to the container via said flexible tubing;

determining whether the integrity of the filter, and consequently the sterility of the unit, has been maintained during the transfer process, said determining step comprising the steps of introducing a pressurized gas into the filter and observing through a light-transmissive portion in the sterile unit for gas bubbles, which would indicate a loss of filter integrity and unit sterility.

4,360,436

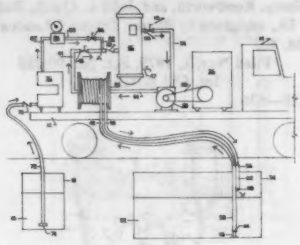
MOBILE FUEL EXTENDING SYSTEM AND METHOD

Vito L. Poveromo, 152 Oakside Rd., Smithtown, N.Y. 11787

Filed Aug. 26, 1981, Ser. No. 296,543
Int. Cl.³ B01D *17/02, 35/02*
U.S. Cl. 210—799 **9 Claims**

6. A method for the in situ reprocessing of waste oil product for use as a fuel comprising continuously and simultaneously carrying out the steps of withdrawing said waste oil product from a first reservoir means in which said product has been collected, filtering said product to remove foreign particulate matter, withdrawing fuel oil from a second reservoir means in which said oil is stored for use, mixing the filtered product and

said oil, adjusting the volumetric ratio of said product to said oil to obtain a preselected mixture, filtering the mixture to



remove water and other foreign particulate matter, and supplying said mixture to said second reservoir means.

4,360,437

CONCENTRATED TEXTILE TREATMENT COMPOSITIONS AND METHOD FOR PREPARING THEM

Wilhelm H. O. Wolfes, Brussels, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 5, 1981, Ser. No. 222,418

Claims priority, application United Kingdom, Jan. 11, 1980, 8001002; Oct. 14, 1980, 8033043

Int. Cl.³ D06M *13/36, 13/46*

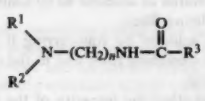
U.S. Cl. 252—8.8 **6 Claims**

1. An aqueous textile treatment composition exhibiting viscosities of no more than about 700 centipoise over the temperature range of 25° C. to 65° C., said composition comprising

(a) from about 8% to about 16% of water-insoluble cationic fabric softener selected from the group consisting of (i) compounds of the general formula $R^aR^bR^cR^dN^+X^-$ wherein R^a and R^b are each selected from C_{12}–C_{24} alkyl groups, R^c and R^d are each selected from C_1–C_4 alkyl groups and X is an anion, (ii) Di-C_{12}–C_{24} alkyl imidazolinium salts, and (iii) mixtures thereof;

(b) from about 5% to about 20% of C_{14}–C_{22} hydrocarbon;

(c) from about 0.15% to about 0.7% of an amine-derived compound having the formula



wherein R^1 and R^2 are each selected from methyl or ethyl groups, n is 2 or 3, and R^3 is a C_{16}–C_{18} alkyl group; wherein the weight ratio of (a):(b) is from about 3:1 to 1:2.

4,360,438

ORGANOMOLYBDENUM BASED ADDITIVES AND LUBRICATING COMPOSITIONS CONTAINING SAME

Eugene V. Rowan, Rowayton, and Homer H. Farmer, Westport, both of Conn., assignors to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Jun. 6, 1980, Ser. No. 157,135

Int. Cl.³ C10M *1/54, 3/48, 5/28*

U.S. Cl. 252—33.6 **10 Claims**

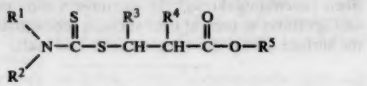
1. A synergistic antiwear composition comprising:

(1) an organomolybdenum compound of the formula:

$$[R_2N{-}C(S){-}S{-}]_2Mo_2O_mS_n$$

wherein R represents alkyl,
m=2.35 to 3,
n=1.65 to 1,
m+n=4; and

(2) an organic sulfur compound of the formula:



wherein
R^1, R^2 and R^5 represent alkyl groups having 1 to 18 carbon atoms,
R^3 represents H and —C(O)—O—R^5, and
R^4 represents H and methyl;

a wherein the ratio of the molybdenum compound to the sulfur compound is about 1:4 to about 4:1.

4,360,439

COMPOSITION FOR THE DE-INKING OF PRINTED WASTE PAPER BY THE WASHING PROCESS

Giulio Calmanti; Salvatore Gafa, both of Milan; Giovanni M. Dadea, Tradate; Alfonso Gatti, Novi Ligure, and Fulvio Burzio, Milan, all of Italy, assignors to Montedison S.p.A., Italy

Continuation-in-part of Ser. No. 952,210, Oct. 17, 1978, Pat. No. 4,231,841. This application Apr. 15, 1980, Ser. No. 140,481

Claims priority, application Italy, Oct. 20, 1977, 28816 A/77; Sep. 1, 1978, 27242 A/78

Int. Cl.³ C09D *9/00, 9/04;* C09K *3/00;* D21C *5/02*

U.S. Cl. 252—61 **6 Claims**

1. A de-inking composition consisting essentially of:

(A) a salt of a fatty acid of the formula

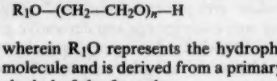
$$R{-}COO{-}M$$

wherein R represents one or more saturated and/or unsaturated hydrocarbon groups having from 9 to 21 carbon atoms, and wherein M is Na or K, said fatty acid salt being present in an amount between 15% and 32% with respect to the weight of the entire composition;

(B) a non-ionic surfactant consisting of an ethoxylated fatty alcohol of the formula:

$$R_1O{-}(CH_2{-}CH_2O)_n{-}H$$

wherein R_1O represents the hydrophobic portion of the molecule and is derived from a primary or secondary fatty alcohol of the formula



wherein R'', R''', and R'''' are alkyl groups and
n is a number between 4 and 25;
said non-ionic surfactant being present in an amount of about 10% to about 25% by weight, based upon the entire composition, the weight ratio between said one-ionic surfactant and the anionic surfactant (C) hereinafter being at least 2.5:1, the nature of the composition being more lipophilic than hydrophilic;

(C) an anionic surfactant selected from the group consisting of sulphonates of the formula

$$R^2{-}SO_3{-}M';$$

sulphates of the formula

$$R^3{-}O{-}SO_3{-}M';$$

and mixtures thereof, wherein;
R^2 is selected from the group consisting of a linear paraffin group, an olefin group, and an alkylaryl group;

R^3 is a paraffin group; and

M′ is selected from the group consisting of Na, K, NH_4 and mono-, di-, tri-substituted alkylamines;

said anionic surfactant being present in an amount between 2% and 8% with respect to the weight of the entire composition;

(D) a sodium carboxylmethylcellulose present in an amount between 1% and 5% with respect to the weight of the entire composition; and

(E) an alkaline inorganic salt selected from the group consisting of metasilicate, disilicate, carbonate, borate, and polyphosphates, said alkaline inorganic salt present in an amount between 30% and 80% with respect to the weight of the entire composition; the percentages of the components (A), (B), (C), (D), and (E) totaling essentially 100%.

4,360,440

INSULATING FIBER MIXTURE, ADHESIVE, AND PROCESS

Harold F. Boyer, Houston, and John L. Webb, Richmond, both of Tex., assignors to Fulbright & Jaworski, Houston, Tex.

Filed May 13, 1981, Ser. No. 263,225

Int. Cl.³ C04B *43/00*; E04B *1/74*

U.S. Cl. 252—62 **4 Claims**

1. A process for applying an insulating mixture onto an object and for thereby building-up the insulating mixture on the object to a desired thickness, the process including

mixing together in a container a fiber adhesive mixture of about 40% sodium silicate and about 60% acrylic resin and agitating them together sufficiently to form a homogenous mixture,

mixing water with the adhesive mixture in a container so that the ratio of water to adhesive mixture is about 3.5 to 1 by volume,

mixing insulating fiber with the adhesive-water mixture so that the ratio of fiber to adhesive-water mixture is about 1 lb. fiber to about ¼ gallon adhesive-water mixture,

introducing the fiber-water-adhesive mixture into an application apparatus, and

applying the fiber-water-adhesive mixture onto an object to a desired thickness.

4,360,441

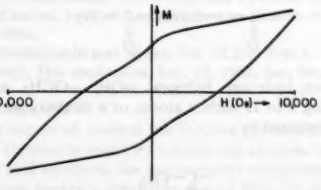
GLASS-ENCAPSULATED MAGNETIC MATERIALS AND METHODS FOR MAKING THEM

Nicholas F. Borrelli, Elmira; David L. Morse, and Jan W. H. Schreurs, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,090

Int. Cl.³ C03C *3/30*; C04B *35/26, 35/28, 35/32*

U.S. Cl. 252—62.59 **11 Claims**



1. A ferrimagnetic material consisting of ferrimagnetic iron oxide crystallites dispersed in a glass matrix, the crystallites being selected from the group consisting of gamma-Fe_2O_3, Fe_3O_4, and mixtures or solid solutions thereof, said crystallites having a maximum diameter not exceeding about 0.05 microns and said material having a coercivity of at least about 1000 Oe at 25° C.

2. A method of making a ferrimagnetic material which comprises the steps of: impregnating a porous glass with an organometallic iron compound; reacting the iron compound with the pore walls of the porous glass at a temperature below the thermal decomposition temperature of the iron compound; and heating the glass to a temperature at least sufficient to expel unreacted iron compound from the glass and convert the iron in the glass to iron oxide.

4,360,442

ETHYLENE CARBONATE AS A PHASE-CHANGE HEAT STORAGE MEDIUM

James D. Reedy, New Fairfield, and Daniel Pittner, Mahopac, both of Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 14, 1981, Ser. No. 311,271

Int. Cl.³ C09K *5/06*

U.S. Cl. 252—70 **3 Claims**

1. In a process for the storage of heat comprising heat transfer to and from a heat storage medium wherein the heat storage medium changes phase as it absorbs or releases heat, the improvement comprising the use of ethylene carbonate containing hexamethylcyclotrisiloxane as the heat storage medium.

4,360,443

STORAGE FIRE RESISTANT HYDRAULIC FLUID

Albert M. Durr, Jr., Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed May 11, 1981, Ser. No. 262,589

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—76 **13 Claims**

1. A composition for forming an oil in water emulsion consisting essentially of from about 0.2 to about 10 parts of a succinic ester of a hydrocarbon substituted succinic acid having at least about 50 aliphatic carbon atoms in the substituent, a polyhydric alcohol from about 0.1 to 5 parts of an alkaline earth metal salt of a fatty acid having at least about 12 aliphatic carbon atoms in the fatty radical and from about 0.1 to about 5.00 parts of at least one material selected from the group consisting of polyoxyethylene ethers containing from 8 to 14 oxyethylene units derived from saturated and unsaturated normal alcohols containing from 10 to 20 carbon atoms and organic acids containing from 6 to 22 carbon atoms when adducted with from 8 to 14 oxyethylene units.

4,360,444

GETTER BODY

Robert Esterl, Reinstorf, and Josef Weiser, Hohenschaeftlarn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,571

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008290; Jan. 15, 1981, 3101128

Int. Cl.³ H01J *7/18*

U.S. Cl. 252—181.1 **1 Claim**

1. In an improved getter body for use in encapsulated electrical components consisting of a compressed tablet from a powder mixture having as an active component a getter material the improvement of which comprises:

a getter body powder mixture consisting essentially of

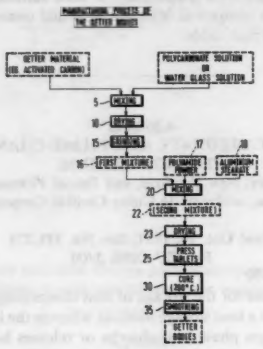
a getter material in the amount of up to 70 percent by weight;

aluminum stearate in the amount of approximately 10 percent by weight;

and

a binder consisting essentially of polyamide and a compound selected from the group consisting of polycarbonate and

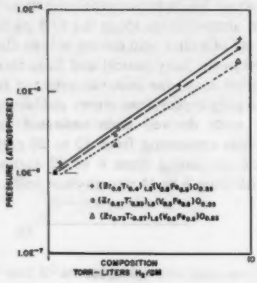
potassium- and sodium-silicate solutions, said binder comprising approximately 10 percent by weight of polycarbonate or potassium- and sodium-silicate solution and approximately 90 percent by weight of polyamide.



4,360,445
OXYGEN STABILIZED ZIRCONIUM-VANADIUM-IRON ALLOY

Marshall H. Mendelsohn, Woodridge, and Dieter M. Gruen, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1981, Ser. No. 274,117
Int. Cl.³ H01J 7/18; C22C 16/00
U.S. Cl. 252—181.6 **4 Claims**



1. An oxygen stabilized intermetallic compound capable of reversibly sorbing hydrogen having the chemical formula $(Zr_{1-x}Ti_x)_{2-u}(V_{1-y}M_y)O_z$ where x=0 to 0.9, y=0.01 to 0.9, z=0.25 to 0.5, u=0 to 1 and M is selected from the group consisting of iron, nickel, cobalt and manganese.

4,360,446
STORAGE STABLE REACTIVE PEROXIDE PASTE COMPOSITION

Robert W. Smearing, Pittsfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,283
Int. Cl.³ C11D 3/395; C07C 179/06
U.S. Cl. 252—428 **8 Claims**

1. A storage stable, reactive peroxide paste composition comprising:

(a) dibenzoyl peroxide or a dibenzoyl peroxide having one or more substituents selected from halogen, lower alkyl or lower alkoxy;

(b) a fumarate plasticizer therefor comprising a di-(hydroxy-lower-alkoxylower alkyl) fumarate; and

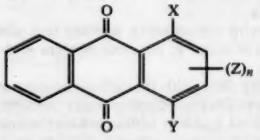
(c) finely divided particulate mineral filler in an amount sufficient to prevent the composition from physically separating into its components.

4,360,447
COMPOSITION FOR LIQUID CRYSTAL COLOR DISPLAY ELEMENTS

Ryoichi Morinaka; Ryoichi Tukahara; Tsutomu Nishizawa, and Tuneo Hidaka, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

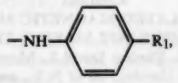
Filed Mar. 11, 1980, Ser. No. 129,315
Claims priority, application Japan, Mar. 16, 1979, 54-30057; May 25, 1979, 54-63996; Jun. 25, 1979, 54-79086
Int. Cl.³ G02F 1/13; C09K 3/34
U.S. Cl. 252—299.1 **8 Claims**

1. A composition for nematic liquid crystal color display elements, said composition comprising at least one nematic liquid crystal and at least one anthraquinonic dye represented by the following formula

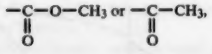


(I)

wherein X and Y are identical or different and represent $-NH_2$ or —OH; Z is bonded to the 2-position and/or 3-position relative to X and represents —OR, —NHR,



$-CONHR_2$ or $-COOR_2$, in which R represents an alkyl group having 4 to 15 carbon atoms or a lower alkyl group substituted by —OH,



R_1 represents hydrogen, halogen, —OH, $-OCH_3$, an alkyl group having 1 to 15 carbon atoms, or a methoxy group optionally substituted by

and R_2 is a phenyl group, an alkyl group having 2 to 5 carbon atoms or a cyclohexyl group; and n is an integer of 1 or 2 provided that when X is $-NH_2$ and Y is —OH, and when X and Y are both —OH, n is an integer of 1, and when n represents an integer of 2, the two Z's may be identical or different, or one may be the group defined above and the other may be a halogen, said anthraquinonic dye being dissolved in the nematic liquid crystal.

4,360,448

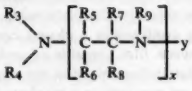
WATER IN OIL EMULSIONS USEFUL IN LIQUID MEMBRANE

Norman N. Li, Edison; Robert P. Cahn, Milburn, and Adam L. Shrier, Montclair, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 174,990, Aug. 25, 1971, Pat. No. 3,779,907, and a continuation-in-part of Ser. No. 28,094, Apr. 13, 1970, Pat. No. 3,617,546. This application Oct. 9, 1973, Ser. No. 404,716
Int. Cl.[3] B01J *13/00*
U.S. Cl. 252—309 5 Claims

1. A water-in-oil emulsion, useful in liquid membrane processes, comprising a nonionic oil soluble surfactant, present at from 0.01 to 10 weight % of said emulsion, an oil soluble ion exchange compound in the exterior phase, said oil soluble ion exchange compound being present at from 5 to 75 weight % of said emulsion and selected from compounds having the general formula:

wherein R and R_1 are independently selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_6 to C_{20} aryl and C_7 to C_{20} alkaryl radicals and R_2 is selected from the group consisting of C_6 to C_{30} alkyl, C_6 to C_{20} aryl and C_7 to C_{20} alkaryl radicals; and



wherein R_3, R_4, R_5, R_6, R_7, R_8, R_9 and y are independently selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_6 to C_{20} aryl, C_7 to C_{20} alkaryl radicals and substituted derivatives thereof, and x is an integer of from 1 to 100.

4,360,449

ALUMINA DISPERSION BEHAVIOR

Richard K. Oberlander, Ponca City, and Lewis B. Decker, Jr., Lake Charles, both of La., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 72,265, Sep. 4, 1979, abandoned. This application Aug. 14, 1981, Ser. No. 292,773
Int. Cl.[3] B01J *13/00*
U.S. Cl. 252—313 R 6 Claims

1. An improved method for forming gel-resistant suspensions of alumina in water by mixing said alumina with dilute aqueous acid solutions, the improvement comprising treating PB alumina having a crystallite size of from 25 to 400 angstroms in a sealed autoclave prior to forming the suspension by heating said alumina to temperatures of from about 250° F. to about 700° F. in the presence of from about 10 to about 80% water based upon the weight of total alumina present and allowing the autoclave to achieve autogenous pressure for a time ranging from about 5 minutes to about 24 hours, then relieving pressure at a rate sufficient to dry said alumina and recovering said dry alumina.

6. A stable alumina dispersion obtained from the process of claim 1.

4,360,450

COLLOIDAL AQUEOUS DISPERSION OF AN ALKALI METAL POLYANTIMONATE AND A PROCESS OF MAKING SAID

Destin A. LeBlanc, Manchester, Mo., assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation of Ser. No. 68,260, Aug. 20, 1979, Pat. No. 4,307,148. This application Nov. 25, 1981, Ser. No. 325,079
Int. Cl.[3] B01J *13/00*; C09K *3/28*
U.S. Cl. 252—313 R 6 Claims

1. A colloidal aqueous dispersion of an alkali metal polyantimonate containing a mole ratio of alkali metal to antimony in the dispersion of at least about 0.3:1.

5. A method of preparing the colloidal aqueous dispersion of claim 1 comprising adding an alkali metal base to an aqueous solution of antimonic acid prior to or during polymerization to polyantimonic acid.

4,360,451

AMPHOTERIC SURFACTANT GELS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 10, 1981, Ser. No. 291,337
Int. Cl.[3] B01J *13/00*
U.S. Cl. 252—316 6 Claims

1. An amphoteric surfactant gel comprising based on the total of 100 parts by weight (a) from about 5 to about 50 parts by weight of amphoteric surfactant, (b) from about 10 to about 80 parts by weight of water, (c) from about 15 to about 40 parts by weight of a polyoxybutylene-polyoxyethylene block copolymer, said block copolymer being a cogeneric mixture of conjugated polyoxybutylene-polyoxyethylene compounds containing in their structure oxybutylene groups, oxyethylene groups and an organic radical derived from a water-soluble organic compound containing a plurality of reactive hydrogen atoms and 2 to 12 carbon atoms; the compounds being characterized in that all of the oxybutylene groups are present in polyoxybutylene chains that are attached to the organic radical at the site of a reactive hydrogen atom thereby constituting a polyoxybutylene polymer; the oxyethylene groups being attached to the polyoxybutylene polymer in polyoxyethylene chains; the average molecular weight of the polyoxybutylene polymers in the mixture being at least 1200, as determined by hydroxyl number, and the oxyethylene groups present constituting 50 to 80 percent, by weight, of the mixture, with the provisos that

(a) when the hydrophobe molecular weight is about 1200, then the minimum polyoxyethylene content is about 60 percent by weight of the block copolymer and the minimum block copolymer content to form a gel is about 25 percent by weight of the aqueous gel compositions;

(b) when the hydrophobe molecular weight is about 1800, then the minimum polyoxyethylene content is about 55 percent by weight of the block copolymer and the minimum block copolymer content to form a gel is about 20 percent by weight of the aqueous gel composition;

(c) when the hydrophobe molecular weight is about 2400, then the minimum polyoxyethylene content is about 50 percent by weight of the block copolymer and the minimum block copolymer content to form a gel is about 16 percent by weight of the aqueous gel composition;

(d) when the hydrophobe molecular weight is about 3000, then the minimum polyoxyethylene content is about 45 percent by weight of the block copolymer and the minimum block copolymer content to form a gel is about 16 percent by weight of the aqueous gel composition.

4,360,452

EMULSIFIER COMPOSITION

Karl Zabrocki, Buettgen, and Kurt Schaupp, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,257

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932687

Int. Cl.³ B01F *17/36;* B01D *19/04*

U.S. Cl. 252—356 6 Claims

1. An emulsifier composition comprising by weight (a) about 5 to 30 parts of a non-ionic emulsifier having an HLB-value of about 10 to 20 and (b) about 10 to 40 parts of a polyoxyalkylene-polyester of which about 5 to 50% by weight comprises polyoxyalkylene radicals connected to the balance of the polyoxyalkylene-polyester molecules through urethane groups.

4,360,453

PREPARATION OF VANADIUM PHOSPHORUS CATALYSTS

Michael F. Lemanski, Euclid; Gregory G. Spitnale, Bedford Hts., and Ernest C. Milberger, Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 28, 1980, Ser. No. 210,885

Int. Cl.³ B01J *27/14*

U.S. Cl. 252—435 13 Claims

1. In a process for the preparation of oxidation catalysts containing the mixed oxides of vanadium and phosphorus, the improvement wherein a solubilized vanadium phosphorus oxide catalyst precursor is prepared in an organic liquid medium, including the step of extracting the solubilized catalyst precursor from the organic liquid with water to form a solubilized catalyst precursor-containing aqueous solution.

4,360,454

CATALYST FOR STEAM DEHYDROCYCLIZATION

Richard F. Love, Fishkill; Tansukhlal G. Dorawala, and Edwin R. Kerr, both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 103,303, Dec. 13, 1979, Pat. No. 4,320,240. This application Jun. 18, 1981, Ser. No. 274,854

Int. Cl.³ B01J *23/58, 23/64, 23/72, 23/89*

U.S. Cl. 252—465 8 Claims

1. A catalyst composition consisting essentially of a porous support, a catalytic amount of a Group VIII metal, a Group IA metal, and an activating amount of a Group IB metal.

4,360,455

PREPARATION OF MIXTURES OF BROMINATED POLYSTYRENES AND BROMINATED AROMATIC COMPOUNDS

Gerhard Lindenschmidt, Leimen; Wolfgang Schulte, Hassloch; Franz Brandstetter, Neustadt; Herbert Naarmann, Wattenheim, and Klaus Penzien, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

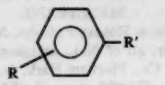
Filed Jan. 26, 1981, Ser. No. 228,368

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006448

Int. Cl.³ C08L *27/24*

U.S. Cl. 252—609 2 Claims

1. A process for the preparation of a mixture of brominated polystyrenes and brominated aromatic compounds, wherein (a) polystyrenes which have a degree of polymerization of from 3 to 400 and may or may not contain olefinic double bonds are reacted, in the presence of a halohydrocarbon solvent and of from 1 to 40% by weight, based on polystyrene, of a Lewis acid catalyst, and (b) in the additional presence of aromatic compounds of the general formula



where R is CH_3—, C_2H_5—, 2-haloethyl, phenyl or phenoxy and R' is H—, CH_3—, C_2H_5—, 2-haloethyl, phenyl or phenoxy, with bromine at from −30° C. to +130° C., the hydrogen bromide and Lewis acid catalyst are extracted with water and the solvent and any other volatile constituents are removed from the organic phase.

4,360,456

KNEADABLE MASTIC COMPOSITION COMPRISED OF EPOXY RESIN AND AROMATIC CURING AGENT

Francis G. Firth, Los Angeles, Calif., assignor to Applied Plastics Co., Inc., El Segundo, Calif.

Division of Ser. No. 19,266, Mar. 9, 1979, Pat. No. 4,269,751. This application Nov. 13, 1980, Ser. No. 208,471

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ C08L *63/00, 6/20*

U.S. Cl. 523—456 9 Claims

1. A two component epoxy resin and curing means therefor, shelf stable in close side by side relationship, sharing the same environment being confined in a closed container and packaged upon or between film, capable of ambient temperature curing to a solid state when mixed in the correct proportions, said resin component comprising a bisphenol diglycidyl ether and inert fillers, so combined to form a palpable mastic,

the curing means in mastic form, consisting essentially of an aromatic diamine-formaldehyde reaction product, a mutual solvent, inert fillers and a catalyst selected from the group consisting of 2-hydroxy benzoic acid and benzoic acid.

4,360,457

S-SULFONATED IMMUNOGLOBULIN COMPOSITION HAVING A HIGH MONOMER CONTENT AND A PROCESS FOR PRODUCTION THEREOF

Syoji Ono, Kodaira; Yuji Fukumoto, Hino, and Tsunemasa Yoshida, Hachioji, all of Japan, assignors to Teijin Limited, Osaka and The Chemo-Sero-Therapeutic Research Institute, Kumamoto, both of, Japan

Filed Aug. 28, 1980, Ser. No. 182,053

Claims priority, application Japan, Aug. 30, 1979, 54-109644; Aug. 30, 1979, 54-109645; Oct. 17, 1979, 54-132786

Int. Cl.³ C07G *7/00*

U.S. Cl. 260—112 B 3 Claims

1. A process for producing an S-sulfonated immunoglobulin composition having a high monomer content, which comprises contacting an S-sulfonated immunoglobulin in aqueous solution with about 10 to about 600% by weight, based on the weight of the S-sulfonated immunoglobulin, of a water-soluble acid addition salt of a basic amino acid and having a pKb at 25° C. of not more than 7 at a temperature of about 0° C. to about 50° C. in the absence of freezing and at a pH of from about 5 to about 8 thereby to prevent aggregation of the monomer of the S-sulfonated immunoglobulin in the aqueous solution, and when the S-sulfonated immunoglobulin contains aggregated molecules, dissociating the aggregated molecules into monomers.

4,360,458

ANTITUMOR ANTIBACTERIAL AGENTS

Hideo Koshiyama, Musashino; Fumihide Sakai, Yokohama, and Hiroaki Ohkuma, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 26,488, Apr. 2, 1979, abandoned. This application Mar. 6, 1980, Ser. No. 122,626

Int. Cl.[3] C07C *103/52;* C07G *7/00;* A61K *37/00*

U.S. Cl. 260—112.5 R 6 Claims

1. The antitumor antibiotic compound BBM-928A which in its substantially pure form has these characteristics:

(a) soluble in chloroform and methylene chloride, slightly soluble in benzene, ethanol, methanol and n-butanol, and substantially insoluble in water and n-hexane;

(b) gives a positive reaction with ferric chloride and Ehrlich reagents and a negative reaction with Tollens, Sakaguchi and ninhydrin reagents;

(c) is an effective antitumor agent against P388 leukemia, L1210 leukemia, B16 melanoma, Lewis Lung carcinoma, and sarcoma 180 ascites tumors intraperitoneally implanted in the mouse;

(d) has a melting point of 246°–248° C.;

(e) has a specific rotation of $[\alpha]_D^{25} = -27°$ (c 1, $CHCl_3$);

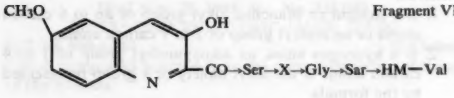
(f) has a molecular weight of 1427;

(g) has an approximate elemental composition of 52.47% carbon, 5.48% hydrogen, 13.81% nitrogen, and 28.24% oxygen;

(h) exhibits in silica gel thin layer chromatography a R_f value of 0.71 with the solvent system n-butanol-methanol-water (63:27:10), and a R_f value of 0.48 with the solvent system xylene-methylethylketone-methanol (5:5:1);

(i) affords on acid hydrolysis water-soluble ninhydrin positive substances including beta-hydroxy-N-methylvaline, glycine, serine, and sarcosine;

(j) affords on base hydrolysis Fragment VI



Fragment VI

wherein Ser is serine, Gly is glycine, Sar is sarcosine, HM-Val is beta-hydroxy-N-methulvaline and the symbol X represents an amino acid moiety;

(k) has an infrared absorption spectrum in potassium bromide substantially as shown in FIG. 1; and

(l) when dissolved in deuterated chloroform gives a proton NMR spectrum substantially as shown in FIG. 5.

4,360,459

SULPHUR DYESTUFFS OF THE CARBAZOLE SERIES

Steffen Piesch, Oberursel, and Wolf Weidemüller, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

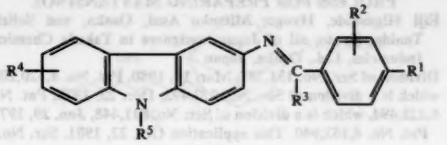
Filed Apr. 6, 1981, Ser. No. 251,172

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013625

Int. Cl.[3] C07D *49/12*

U.S. Cl. 260—130 3 Claims

1. Sulphur dyestuffs prepared by sulphurizing a carbazole derivative according to the boil-melt or bake-melt sulphurization process wherein said carbazole derivative is a carbazoleazomethine of the formula



wherein

R^1 is hydrogen, hydroxyl, halogen, nitro, alkyl having 1 to 8 carbon atoms, alkoxy having 1 to 8 carbon atoms, dialkylamino having 1 to 4 carbon atoms per alkyl, alkanoyloxy having 1 to 8 carbon atoms, benzoyloxy, alkanoylamino having 1 to 8 carbon atoms or benzoylamino;

R^2 is hydrogen, hydroxyl, halogen, alkyl having 1 to 8 carbon atoms or alkoxy having 1 to 8 carbon atoms;

R^3 is hydrogen or alkyl having 1 to 7 carbon atoms;

R^4 is hydrogen or halogen; and

R^5 is hydrogen or alkyl having 1 to 8 carbon atoms.

4,360,460

NOVEL AZO DYES HAVING A 4-SULFO-5-AMINOMETHYL NAPHTHALENE COUPLING MOIETY

Rudolf Hurter, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

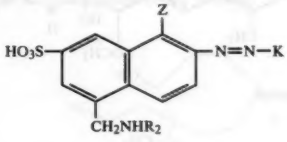
Division of Ser. No. 23,514, Mar. 23, 1979, Pat. No. 4,288,363. This application Dec. 16, 1980, Ser. No. 217,277

Claims priority, application Switzerland, Apr. 3, 1978, 3537/78

Int. Cl.[3] C09B *29/00, 63/00*

U.S. Cl. 260—156 5 Claims

1. Azo dyes of the formula



wherein K is the radical of a coupling component, Z represents hydrogen or the sulfo group and R_2 represents hydrogen or an acyl radical.

4,360,461

PROCESS FOR OBTAINING CAPROLACTAM BY CLEAVING CAPROLACTAM OLIGOMERS

Hugo Fuchs; Elmar Frommer, and Otto-Alfred Grosskinsky, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 28, 1981, Ser. No. 287,696

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030735

Int. Cl.[3] C07D *201/12*

U.S. Cl. 260—239.3 A 5 Claims

1. An improved process for obtaining caprolactam by cleaving caprolactam oligomers by passing them through an alumina catalyst bed at an elevated temperature, wherein the improvement comprises introducing the oligomers, as liquid or solid, into a fluidized bed of alumina and cleaving them at from 290° to 400° C. in the presence of steam.

4,360,462

PROCESS FOR PREPARING MAYTANSINOL

Eiji Higashide, Hyogo; Mitsuko Asai, Osaka, and Seiichi Tanida, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

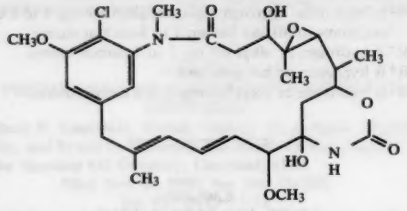
Division of Ser. No. 131,787, Mar. 19, 1980, Pat. No. 4,320,200, which is a division of Ser. No. 972,492, Dec. 22, 1978, Pat. No. 4,225,494, which is a division of Ser. No. 811,448, Jun. 29, 1977, Pat. No. 4,162,940. This application Oct. 22, 1981, Ser. No. 313,974

Claims priority, application Japan, Mar. 31, 1977, 52/37166; Apr. 1, 1977, 52/37886

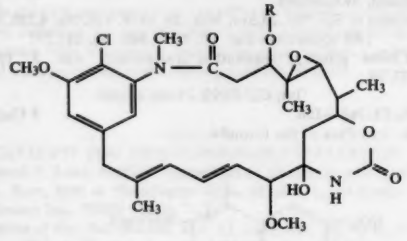
Int. Cl.³ C07D *498/18*

U.S. Cl. 260—239.3 P **3 Claims**

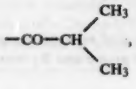
1. A method of producing a compound of the formula:



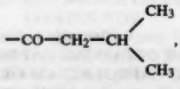
which comprises subjecting Antibiotic C-15003 of the formula:



wherein R represents



—CO—CH_2—CH_2—CH_3 or



to reductive hydrolysis.

4,360,463

PURE 6,6-DIIODOPENICILLANIC ACID AND PROCESS FOR ITS PREPARATION

Robert J. Sysko, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,678

Int. Cl.³ C07D *499/04*

U.S. Cl. 260—245.2 R **4 Claims**

1. In the process for making 6,6-diiodopenicillanic acid by the diazotization of 6-beta-aminopenicillanic acid in the presence of iodine, the improvement which comprises washing the product of said process with an aqueous alkali metal iodide solution.

4,360,464

PROCESS FOR PRODUCTION OF 1-ARYLOXY-AMINOPROPANE DERIVATIVES

Kunio Tsukamoto, Chofu Mine; Yasushi Suzuki, Yokohama; Akihiro Izumi, Kawasaki, and Yoshio Hiramatsu, Tokyo, all of Japan, assignors to Teikoku Hormone Mfg. Co. Ltd., Tokyo, Japan

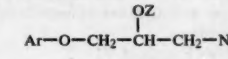
Division of Ser. No. 828,740, Aug. 29, 1977, abandoned, which is a continuation of Ser. No. 92,252, Nov. 23, 1970, abandoned. This application Jun. 6, 1978, Ser. No. 913,238

Claims priority, application Japan, Nov. 28, 1969, 44-95027; Mar. 31, 1970, 45-26548; Mar. 31, 1970, 45-26549; Jul. 21, 1970, 45-63377

Int. Cl.³ C07D *207/24, 317/06*

U.S. Cl. 548—490 **12 Claims**

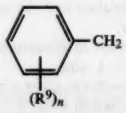
1. A process for the preparation of 1-aryloxy-3-aminopropane derivative expressed by the formula



wherein

R is a straight or branched alkyl group of up to 6 carbon atoms or an aralkyl group of 7 to 9 carbon atoms;

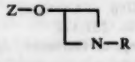
Z is a hydrogen atom, an alkoxymethyl group of 1 to 4 carbon atoms in the alkyl moiety or a group represented by the formula



wherein R^9 is a hydrogen atom or an electron-donor group selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, a halogen atom and a halogenated alkyl group of 1 to 4 carbon atoms, and n is an integer of 1 to 3; and

Ar is a member selected from the group consisting of indolyl groups and 1,4-benzodioxanyl groups,

which comprises reacting in a non-aqueous reaction system a tertiary azetidinol derivative expressed by the formula



wherein Z and R are as defined above,

with a heterocyclic compound selected from the group consisting of hydroxyindols and hydroxy-1,4-benzodioxanes at a temperature of 130° C. to 250° C. in the absence of a catalyst or in the presence of not more than 1/10 mole of a basic catalyst per mole of the heterocyclic compound.

4,360,465
N-ALLYL PYRROLIDINIUM SALT OF α-AMINOACETANILIDES

Ernst Buschmann, Ludwigshafen; Ulrich Schirmer, Heidelberg; Bernd Zeeh; Hubert Sauter, both of Ludwigshafen, and Johann Jung, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

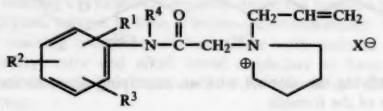
Filed Mar. 24, 1980, Ser. No. 133,241

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1979, 2915250

Int. Cl.³ C07D *207/09*

U.S. Cl. 548—568 **2 Claims**

1. A salt of an α-aminoacetanilide of the formula



wherein

R′ is hydrogen, C_{1-3} alkyl, trifluoromethyl, nitro, chlorine or fluorine,

R^2 is hydrogen, methyl, chlorine or fluorine,

R^3 is hydrogen or chlorine,

R^4 is C_{1-3} alkyl, and

X is chlorine, bromine, nitro, $CH_3OSO_3^{\ominus}$ or $CF_3SO_3^{\ominus}$.

4,360,466
N′-[2,6-DICHLORO-4-(SUBSTITUTED-BENZYLIDENEAMINO)PHENYL]-N,N-DIMETHYLFORMAMIDINES

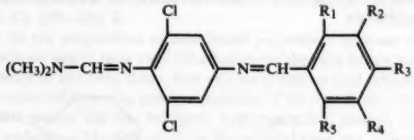
Walter E. Meyer, Suffern, N.Y.; Andrew S. Tomcufcik, Old Tappan, N.J., and Joseph W. Marsico, Jr., Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 25, 1981, Ser. No. 325,069

Int. Cl.³ C07D *307/77;* **C07C** *121/78, 123/00*

U.S. Cl. 549—442 **12 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1, R_2, R_4 and R_5 are each individually selected from the group consisting of hydrogen, fluoro, chloro, bromo, hydroxy, methoxy, methyl and trifluoromethyl; R_3 is selected from the group consisting of hydrogen, fluoro, chloro, bromo, cyano, hydroxy, methoxy, methyl, trifluoromethyl, phenyl, acetamido, dimethylamino and diethylamino; and R_2 and R_3 taken together is methylenedioxy with the proviso that at least two of R_1, R_2, R_3, R_4 and R_5 are hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

4,360,467
PROCESS FOR PREPARING 8-OXABICYCLO[3.2.1]-OCTANE-1-ACETIC ACIDS

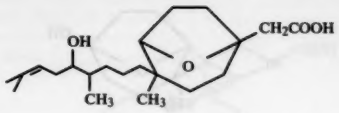
Ramesh M. Kanojia, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 237,321, Feb. 23, 1981, Pat. No. 4,322,357. This application Sep. 8, 1981, Ser. No. 299,704

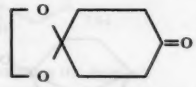
Int. Cl.³ C07D *309/06*

U.S. Cl. 549—397 **7 Claims**

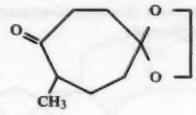
1. The process for the preparation of a compound of the formula



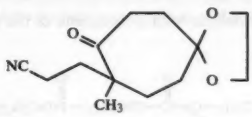
which comprises reacting a compound of the formula



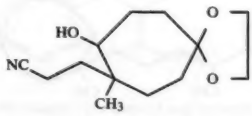
with diazoethane to form a cycloheptanone of the formula



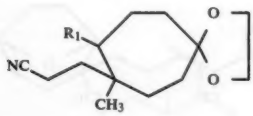
reacting the cycloheptanone with acrylonitrile to form a compound of the formula



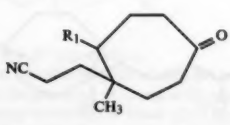
reacting the substituted cycloheptanone with a reducing agent to form a cycloheptanol of the formula



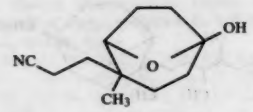
reacting the cycloheptanol with t-butyldiphenylsilyl chloride to form a compound of the formula



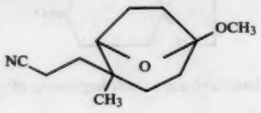
reacting the reaction product with an organic acid to form a ketone of the formula



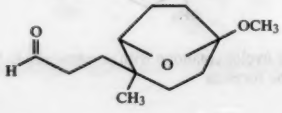
reacting the ketone with tetra-n-butylammonium fluoride to form a bicyclic hemiacetal of the formula



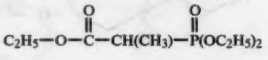
reacting the hemiacetal with trimethylorthoformate in the presence of a mineral acid to form an acetal of the formula



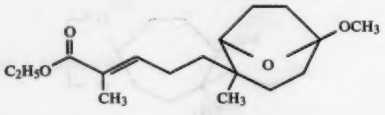
reacting the nitrile with diisobutylaluminum hydride to form an aldehyde of the formula



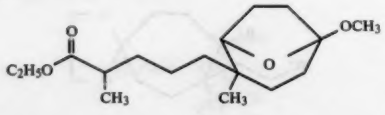
reacting the aldehyde with a compound of the formula



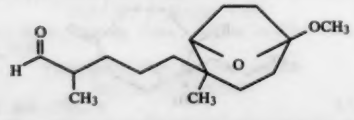
to form an unsaturated ester of the formula



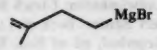
hydrogenating the unsaturated ester to form a saturated ester of the formula



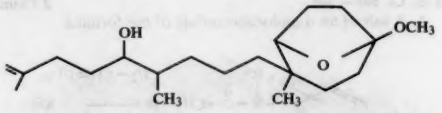
reducing the ester with diisobutylaluminum hydride to form an aldehyde of the formula



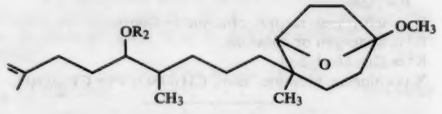
reacting the aldehyde with a Grignard reagent of the formula



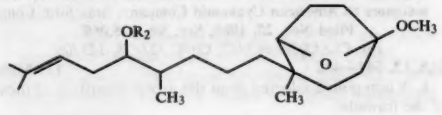
to form a secondary alcohol of the formula



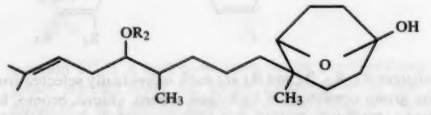
esterifying the alcohol with an esterifying agent to form an ester of the formula



treating the ester with an acid selected from tosic acid and camphorsulfonic acid to form an ester of the formula



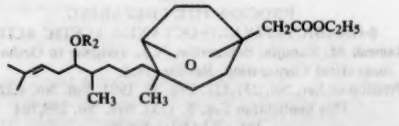
reacting the reaction product with acid to form a hemiacetal of the formula



reacting the hemiacetal with a compound of the formula

$(C_6H_5)_3P{=}CHCOOC_2H_5$

to form a diester of the formula



and hydrolyzing the ester with base, wherein R_1 is a t-butyldiphenylsilyoxy group and R_2 is benzoyl or a lower alkanoyl group having 2–5 carbon atoms.

4,360,468

PREPARATION OF 13-OXABICYCLO[10.3.0]PENTADECANE

Horst Upadek, Erkrath, and Klaus Bruns, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,771

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3040994

Int. Cl.³ C07D *307/93*

U.S. Cl. 549—462 **8 Claims**

1. A process for preparing 13-oxabicyclo[10.3.0]pentadecane which comprises the steps of:

(a) reacting cyclododecanone with elemental bromine in an organic solvent to form α-bromocyclododecanone;

(b) reacting α-bromocyclododecanone with malonic acid dialkyl ester and alkali metal alcoholate to form the ketodiester 2-(2-oxocyclododec-1-yl)-malonic acid dialkyl ester;

(c) hydrolyzing and decarboxylating the ketodiester from step (b) to form the corresponding 2-oxocyclododec-1-yl-acetic acid in an aqueous alkaline solution;

(d) purifying the product of step (c) by extraction with an organic solvent and obtaining 2-oxocyclododec-1-yl-acetic acid;

(e) reacting the product of step (d) with a lower alcohol to form a corresponding ester;

(f) reducing the product of step (e) with a complex metallic hydride to form 2-(2-hydroxyethyl)-cyclododecanol; and

(g) heating the product of step (f) in the presence of an acid catalyst to form 13-oxabicyclo[10.3.0]pentadecane.

4,360,469

PREPARATION OF QUINONES BY SALCOMINE-CATALYZED OXIDATION OF PHENOLS

Hans K. Dietl, and Howard S. Young, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 11, 1970, Ser. No. 45,536

Int. Cl.³ C07C *50/04, 50/08, 50/12, 50/24, 50/28, 76/02*

U.S. Cl. 260—396 R **17 Claims**

1. In the preparation of substituted p-quinones wherein the p-quinone has at least two substituents on the ring in any two or more of the two, three, five and six positions said substituents selected from the group consisting of alkyl of from 1 to 6 carbon atoms, alkoxy, halogens, hydroxy, nitro, phenyl, and the radical—CH=CH—CH=CH—which joins the quinoid ring to form a naphthoquinone ring, by the oxidation of similarly substituted phenols in an inert solvent with a molecular oxygen-containing gas and in the presence of a salcomine catalyst, the improvement which comprises employing as said inert solvent a polar solvent having a dipole moment of at least 2.7.

4,360,470

PROCESS AND INTERMEDIATES FOR THE SYNTHESIS OF VITAMIN D_3 METABOLITES AND CHENODEOXYCHOLIC ACID

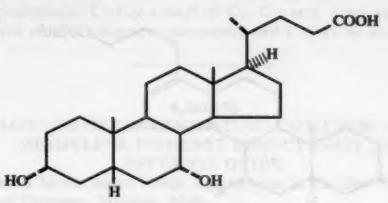
Andrew D. Batcho, North Caldwell; Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 22, 1980, Ser. No. 199,168

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.1 **43 Claims**

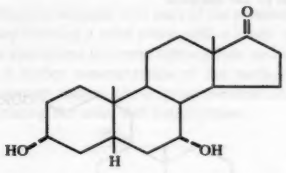
1. A process for the synthesis of chenodeoxycholic acid as characterized by the formula



V

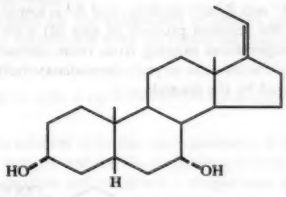
which process comprises the steps of

(a) reacting a compound of the formula



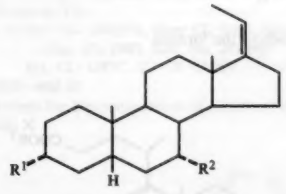
XI

with an ethyltriphenylphosphonium halide in the presence of strong base to yield a compound of the formula



I

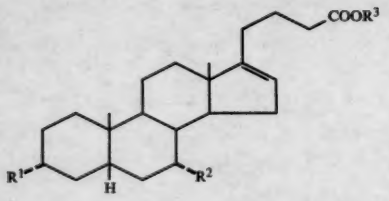
(b) reacting the reaction product of step (a) with an acylating agent in the presence of weak base at temperatures ranging from 0° to 150° C. so as to yield compounds of the formula



II

wherein R^1 and R^2 are acyloxy;

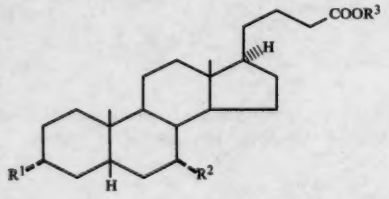
(c) reacting the reaction product of step (b) with an acrylic acid ester in the presence of Lewis acid catalysts selected from the group consisting of lower alkyl aluminum dihalides and aluminum trihalides in weak base in an inert solvent at temperatures ranging from −20° to 45° C. so as to yield a compound of the formula



III

wherein R^1 and R^2 are acyloxy; and R^3 is lower alkyl;

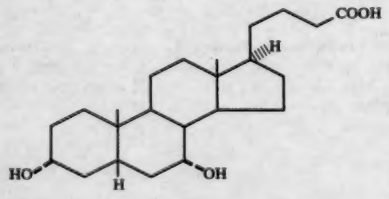
(d) reacting the reaction product of step (c) with hydrogen in the presence of a conventional hydrogenation catalyst thereby reducing the Δ^{16} double bond so as to yield a compound of the formula



IV

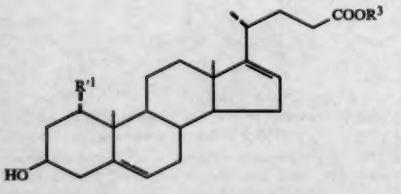
wherein R^1 and R^2 are acyloxy; and R^3 is lower alkyl;

(e) reacting the reaction product of step (d) with aqueous base at temperatures ranging from room temperature to reflux temperature so as to yield chenodeoxycholic acid as characterized by the formula



V

19. Compounds of the formula



VII-A

wherein $R^{1'}$ is hydrogen or hydroxy; and R^3 is lower alkyl.

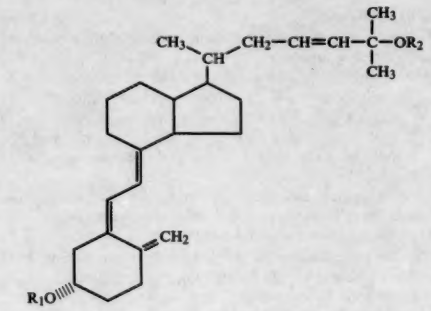
4,360,471

23-DEHYDRO-25-HYDROXYVITAMIN D_3

Hector F. DeLuca; Heinrich K. Schnoes, and Joseph K. Wichmann, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 11, 1981, Ser. No. 329,845
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.2 4 Claims

1. A compound having the formula



wherein each of R_1 and R_2 is selected from the group consisting of hydrogen, acyl and alkylsilyl.

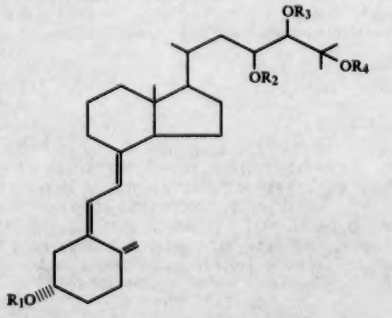
4,360,472

TRIHYDROXYVITAMIN D_3 COMPOUNDS

Hector F. DeLuca; Heinrich K. Schnoes, and Joseph K. Wichmann, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 11, 1981, Ser. No. 329,846
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.2 4 Claims

1. A compound having the formula:



wherein each of R_1, R_2, R_3 and R_4 is selected from the group consisting of hydrogen, acyl and alkylsilyl.

4,360,473

BORON-MODIFIED ASPHALTS

Alfred Marzocchi; Michael G. Roberts, and Charles E. Bolen, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 146,817, May 5, 1980, Pat. No. 4,286,996, which is a division of Ser. No. 48,220, Jun. 13, 1979, Pat. No. 4,246,314. This application Feb. 2, 1981, Ser. No. 230,579
Int. Cl.³ C07F 7/00, 7/28; D02G 3/00
U.S. Cl. 260—429.5 5 Claims

1. A chemically modified bitumen composition prepared by reaction of (a) a bitumen and (b) the reaction product of a chloride or bromide or a metal selected from the group consisting of titanium, gadolium, zirconium, hafnium, aluminum, antimony, tantalum, indium, iron, niobium, molybdenum and tungsten with the compound selected from the group consisting of a trialkyl borate and a trialkoxy boroxine.

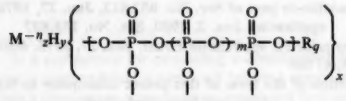
4,360,474

DERIVATIVES OF POLYPHOSPHORIC ACID PARTIAL ESTERS

Thomas P. Brady, Holliston, and Horst G. Langer, Wayland, both of Mass., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 119,064, Feb. 6, 1980, Pat. No. 4,301,025. This application May 18, 1981, Ser. No. 264,265
Int. Cl.³ C07F 7/28
U.S. Cl. 260—429.5 10 Claims

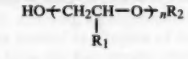
1. A compound of the formula



wherein

R is each occurrence a remnant formed by removal of a hydroxyl from a monohydroxyl compound selected from:

(a) a (poly)glycol monoether of the formula



wherein R_1 is hydrogen, methyl or halomethyl; R_2 is C_{1-6} alkyl or haloalkyl, phenyl, halophenyl or methylphenyl; and n is an integer from 1 to 4;

(b) a phenol or halophenol; and

(c) a C_{1-20} aliphatic or halogenated aliphatic monohydroxyl compound;

provided that in at least one occurrence R is a remnant of (a);

M is independently each occurrence an ammonium or substituted ammonium ion or a metal ion having valence n;

m is an integer from zero to three; y is an integer equal to or greater than zero; and q, x and z are all integers greater than or equal to one selected such that $(z \cdot n) + y = x(m+4-q)$ and $q \leqq m+3$.

4,360,475

TRANSITION METAL BIMETALLIC CLUSTERS OF RUTHENIUM WITH THALLIUM, INDIUM AND GALLIUM

Roy L. Pruett, New Providence, and John S. Bradley, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 8, 1981, Ser. No. 252,050
Int. Cl.³ C07F 9/66
U.S. Cl. 260—441 10 Claims

1. A composition of matter comprising a bimetallic cluster compound of the formula $[M]_n[(Ru_6C(CO)_{16})_2L]$ where M is alkali metal cation, alkaline earth metal cation, $N(R')4^+$, $P(R')4^+$ or $As(R')4^+$ where R' is C_1–C_{20} aliphatic, C_3–C_8 cycloaliphatic, C_7–C_{14} aralkyl or C_6 –C_{10} aryl, n is a number which satisfies valence requirements, and L is Tl, In or Ga.

4,360,476

METHOD OF CONCENTRATING A SOLUTION OF METHYLENE DIPHENYL DIISOCYANATE IN DIPHENYL OXIDE

John G. Green, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 24, 1981, Ser. No. 334,402
Int. Cl.³ C07C 119/048
U.S. Cl. 260—453 SP 4 Claims

1. A method of concentrating a solution of methylene diphenyl diisocyanate in diphenyl oxide, which comprises the steps of:

(a) cooling the solution until part of the solution crystallizes, thereby forming a solid phase with a lower concentration of the methylene diphenyl diisocyanate and a liquid phase with a higher concentration of the methylene diphenyl diisocyanate than in the original solution; and

(b) separating the solid and liquid phases.

4,360,477

CARBONYLATION OF ALKANOLS

John E. Hallgren, and Gary M. Lucas, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,509
Int. Cl.³ C07C 68/00
U.S. Cl. 260—462 9 Claims

1. A process for the production of dialkyl carbonate from alkanols in accordance with the following reaction:

$$4ROH + 2CO + O_2 \xrightarrow{\text{Cupric Halide}} 2R_2CO_3 + 2H_2O$$

where R is selected from the class consisting of methyl, ethyl, propyl, isopropyl, and butyls, comprising reacting the alkanol, carbon monoxide, and oxygen at a temperature above 170° C. and at elevated pressures in the presence of from 0.02 to 1.5%, by weight, cupric halide catalyst, based on the weight of the alkanol.

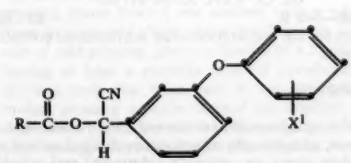
4,360,478

PREPARATION OF α-CYANOBENZYL ESTERS

Charles H. Tieman, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 148,872, May 12, 1980. This application Mar. 30, 1981, Ser. No. 249,041
Int. Cl.³ C07C 121/75; C07D 317/60
U.S. Cl. 260—465 D 15 Claims

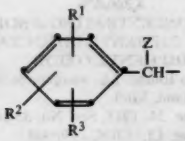
1. A process for the preparation of α-cyanobenzyl esters of the formula X



X

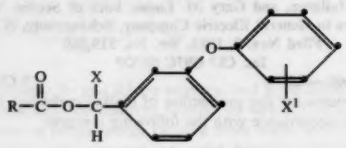
wherein

is the residue of a pyrethroid acid in which R is a group of the formula IX



IX

wherein R_1 is a member selected from the group consisting of hydrogen, methoxy, ethoxy, acetoxy, methylsulfinyl, difluoromethoxy, trifluoromethoxy, C_1-C_4 alkyl, trifluoromethyl, allyl, acetyl, ethoxycarbonyl, methylthio, chlorine, fluorine, iodine, isopropenyl, propargyl, methoxymethyl, ethoxymethyl, chloroallyl, butyryl, butylthio, allyloxycarbonyl, nitro and methoxycarbonyl; R_2 is a member selected from the group consisting of hydrogen, methyl, methoxy, chlorine and bromine; or R^1 and R^2 together are methylenedioxy, trimethylene or tetramethylene; R_3 is hydrogen or methyl; Z is a member selected from the group consisting of C_1-C_4 alkyl, ethoxy, allyl, bromoethyl, cyclohexyl, cyclopropylmethyl, isopropenyl, propargyl, trifluoromethyl and cyano, which comprises treating an α-halobenzyl ester of the formula I



I

wherein

has the above meaning and X is a chlorine, fluorine or bromine atom; and X^1 is a hydrogen, chlorine, fluorine or bromine atom with a water-soluble compound capable of generating cyanide ions (CN^-) in the presence of an inert solvent.

4,360,479

PROCESS FOR THE PREPARATION OF ACYL CYANIDE COMPOUNDS

Kurt Findeisen, Odenthal; Hans Krätzer, Wuppertal, and Manfred Lenthe, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,774

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025304

Int. Cl.³ C07C *51/08, 51/083*

U.S. Cl. 260—545 R **22 Claims**

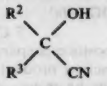
1. Process for the preparation of an acyl cyanide compound of the formula

$$R^1—CO—CN \qquad (I)$$

wherein R^1 is an optionally substituted alkyl radical up to 18 carbon atoms, an optionally substituted cycloalkyl radical with 3 to 12 carbon atoms, an optionally substituted aryl radical or an optionally substituted 5- or 6-membered heterocyclic radical, which can additionally also be fused with a benzene ring, which process comprises reacting a carboxylic acid anhydride of the formula

$$R^1—CO—O—CO—R^1 \qquad (II)$$

with an alpha-hydroxynitrile of the formula



(III)

in which R^2 and R^3 are identical or different and represent a hydrogen atom, an optionally substituted alkyl radical with 1 to 18 carbon atoms, an optionally substituted cycloalkyl radical with 3 to 12 carbon atoms, an optionally substituted aryl radical or an optionally substituted 5- or 6-membered heterocyclic radical, which can additionally also be fused with a benzene ring.

4,360,480

AROMATIC DIAMINO PHOSPHORAMIDES, THIOPHOSPHORAMIDES AND PHOSPHORAMIDATES

Menahem A. Kraus; Moshe A. Frommer, both of Rehovot; Mara Nemas, Neve Monoson, and Rodika Gutman, Kiryat Sharet, all of Israel, assignors to A.T. Ramot Plastics Ltd., Tel-Aviv, Israel

Continuation-in-part of Ser. No. 652,812, Jan. 27, 1976. This application Jun. 2, 1980, Ser. No. 155,837

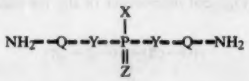
Claims priority, application Israel, Jan. 27, 1975, 46510; Jul. 15, 1975, 47709

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ C08G *69/42*

U.S. Cl. 260—944 **12 Claims**

1. A compound of the formula (I)



wherein

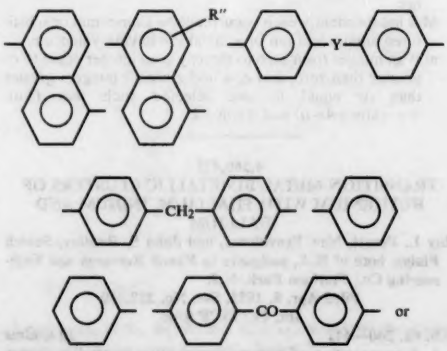
X designates NH Ar', N(R)Ar', NRR', OR, or OAr'

Y designates —O—, —NH—, —S— or —$N(CH_3)$—

Z designates =O or =S

Q is Ar or aralkylene

Ar designates p—C_6H_4, m—C_6H_4, m—C_6H_4, R'C_6H_3,



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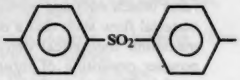


Ar′ designates C_6H_5 or $R'C_6H_4$

R and R′ designate CH_3, C_2H_5 or n—C_3H_7

R″ designates CH_3, C_2H_5, n—C_3H_7, OCH_3, OH, COOH or COOR

4,360,481

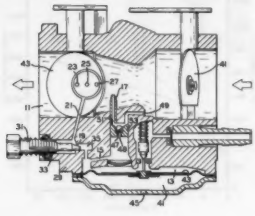
FUEL SUPPLY METERING ARRANGEMENT

Vernon R. Kaufman, Cedarburg, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 28, 1980, Ser. No. 115,907

Int. Cl.³ F02M 1/10

U.S. Cl. 261—39 R **5 Claims**



1. In a carburetor for providing a combustible fuel-air mixture to a conventionally aspirated internal combustion engine having a diaphragm type pressure regulated fuel supply chamber, a fixed size main fuel supply metering orifice and an adjustable idle fuel supply metering orifice with the main fuel supply metering orifice being independent of the idle fuel supply metering orifice and having a check valve in series with the main fuel supply metering orifice for preventing air flow from the main fuel supply metering orifice toward the idle fuel supply metering orifice, an improved temperature compensating fuel supply metering arrangement comprising: an idle fuel supply conduit formed in a region of the body of the carburetor extending from the fuel supply chamber to the bore of the carburetor, a mixture control member formed of a material having a temperature expansion coefficient greater than the temperature expansion coefficient of the body of the carburetor, the mixture control member threadingly engaging the carburetor body, and extending into the idle fuel supply conduit, the mixture control member having generally cylindrical means near the end thereof within the fuel supply conduit extending into and closely fitting a generally cylindrical restricted region thereof for controlling fuel flow according to the extent of penetration of the control member into the restricted region, the mixture control generally cylindrical means fitting closely within the restricted cylindrical region and having a generally tapering V-shaped notch extending along one side thereof of varying depth with the depth being greater near the said one end to define an idle fuel supply limiting orifice of generally pie-shaped cross-section between the V-shaped notch and the restricted cylindrical region to define a minimum fuel flow area having a perimeter to area ratio less than about 400 when all measurements are made in inches, carburetor body temperature increase causing an increased penetration of the cylinder means of the mixture control member into the restricted region of the fuel supply conduit and correlative reduction in fuel flow to thereby minimize the adverse effects of ambient temperature changes on carburetor operation.

4,360,482

AIR-FUEL RATIO CONTROLLER OF VARIABLE-VENTURI TYPE CARBURETOR

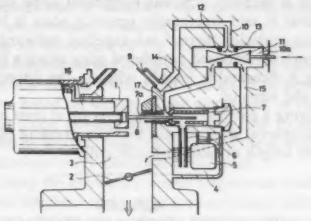
Toshimichi Asai, Aichi, Japan, assignor to Aisan Industry Co., Ltd., Aichi, Japan

Filed Oct. 26, 1981, Ser. No. 314,598

Claims priority, application Japan, Oct. 29, 1980, 55-151652

Int. Cl.³ F02M 9/06

U.S. Cl. 261—44 C **5 Claims**



1. An air-fuel ratio controller of a variable-venturi type carburetor comprising:

an air inlet port opening at the upstream side of a suction piston of said carburetor;

a branching chamber communicated with a passage leading from said air inlet port and branching said passage into a bleed side passage communicating with a bleed portion and a by-pass passage communicating with the downstream side of said suction piston;

and a valve device disposed in said branching chamber and adapted to increase and decrease the areas of said bleed-side passage and by-pass passages relatively to each other in an inverse relationship.

4,360,483

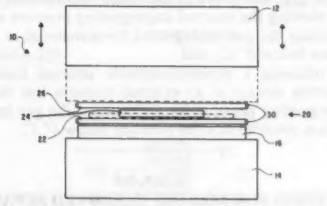
APPARATUS FOR AND METHOD OF PRESSING PLASTIC SHEETS

Ronald L. Ayres, Saugus, Calif., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 10, 1981, Ser. No. 291,159

Int. Cl.³ B29C 17/00, 1/00

U.S. Cl. 264—2.7 **12 Claims**



1. An apparatus for applying pressure to opposed major surfaces of a plastic sheet, comprising a pair of complementarily shaped pressing plates and means for biasing said pair of pressing plates toward one another with a selected pressing force to press said plastic sheet therebetween, wherein at least one of said pressing plates is formed of a fracturable material having at least a partially exposed peripheral edge during pressing such that when said at least one pressing plate is broken pressing particles thereof are expelled outward from said at least partially exposed peripheral edge along a projectile path having a measurable length, wherein the improvement comprises:

means secured to at least portions of the exposed peripheral

edge of said at least one pressing plate for containing said peripheral edge to reduce the length of said projectile path of said outwardly expelled particles.

8. In a method of applying pressure to opposing major surfaces of a plastic sheet, comprising the steps of positioning a plastic sheet between a pair of complementarily shaped pressing plates and biasing said pressing plates toward one another to press said plastic sheet therebetween, wherein at least one of said pressing plates is formed of a fracturable material and has at least a partially exposed peripheral edge during pressing such that if said fracturable pressing plate is broken during pressing particles thereof are expelled outward from said at least partially exposed peripheral edge along a projectile path having a measurable length, wherein the improvement comprises the steps of:

securing a particle retaining layer on at least portions of the peripheral edge of said fracture pressing plate to reduce the length of said projectile path.

4,360,484

PRESSURIZATION AND STORAGE OF THERMOPLASTIC RESIN FOAMS PRIOR TO SECONDARY EXPANSION

Louis C. Rubens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 3, 1981, Ser. No. 250,986
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—28 **6 Claims**

1. In a process for decreasing the density of a thermoplastic olefin polymer resin foam material by secondary expansion, wherein a primarily foamed material of substantially closed-cell structure is impregnated with a gas, so that gas pressure within the cells of the foam is increased to an amount greater than atmospheric, and then said material is heated to a temperature above the melting point of the resin, thereby further expanding the primarily foamed material and producing a lower density foam product,

the improvement, which allows retention of the superatmospheric internal foam pressure during storage prior to secondary expansion, comprising the steps of:

(a) impregnating the primarily foamed resin material with a gas by subjecting said material to a gas at an impregnating pressure greater than atmospheric and a temperature below the melting point of the resin so that the pressure within the cells of the foamed material is increased;

(b) cooling the gas impregnated foam material to a temperature below 0° C. while maintaining the external impregnating pressure at a pressure above atmospheric pressure;

(c) releasing the external impregnating pressure while maintaining the gas impregnated foam material at a temperature below 0° C.; and

(d) retaining a superatmospheric internal foam pressure during storage at an external pressure less than the impregnating pressure by maintaining the gas impregnated foam material at a temperature below 0° C.

4,360,485

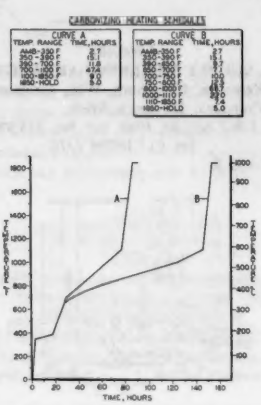
METHOD FOR MAKING IMPROVED SEPARATOR PLATES FOR ELECTROCHEMICAL CELLS

Roger C. Emanuelson, Glastonbury; Warren L. Luoma, Manchester, and William A. Taylor, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 181,439, Aug. 25, 1980, Pat. No. 4,301,222. This application Jun. 8, 1981, Ser. No. 271,072
Int. Cl.³ H01M *2/16*
U.S. Cl. 264—29.5 **6 Claims**

1. In a method for making a thin electrochemical cell separator plate the steps of:

molding, to substantially the desired size of said plate, a well blended mixture of high purity graphite powder and a carbonizable thermosetting phenolic resin in a proportion 45–65 parts by weight graphite and 55–35 parts by weight resin, said molding being done at pressures and temperatures which melt and partially cure the resin and produce material flow such that a density of 97–99 percent of the maximum theoretical density is obtained, said graphite powder consisting of substantially 100% fully graphitic particles having a density of at least 2.0 gm/cc, an average aspect ratio of less than about 0.40, and a distribution of particle sizes up to a maximum of about 230 microns, with between 31 to 62 weight percent of the particles having a



size less than 45 microns, and said resin having a carbon yield of at least 50%, and

heat treating the molded plate to a temperature of at least 2100° C. to carbonize and then fully graphitize the plate, wherein the finished plate has an initial threshold corrosion potential measured at 400° F. of at least 1,000 millivolts, a maximum initial thru-plane electrical resistivity of 0.009 ohm-cm, an initial flexural strength measured at 400° F. of at least 4,000 psi, and an electrolyte take-up no greater than 5.0 percent.

4,360,486

PROCESS FOR INTRODUCING AN ADDITIVE MATERIAL TO POLYMERIC FOAMS

Daniel J. DiBiasi, and Charles M. Krutchen, both of Pittsford, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,024
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—37 **9 Claims**

1. A process for preparing a foamed styrene polymer composition which comprises:

introducing a polymer charge comprising virgin styrene polymer, free of any antioxidant, into a first comparatively high temperature stage of an extruder and melting the same;

dissolving an antioxidant into a liquid foaming agent;

introducing the antioxidant-foaming agent solution to the molten polymer under pressure and intimately mixing the combination;

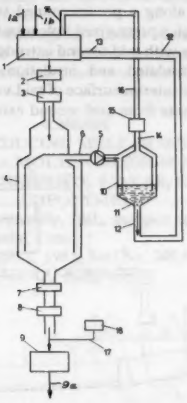
transporting the molten polymer to a comparatively low temperature stage of the extruder; and extruding the molten polymer in foamed form.

4,360,487

PROCESS FOR HOT BRIQUETTING OF ORGANIC SOLID MATERIALS

Alois Janusch, Leoben-Seegraben, Austria, assignor to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Nov. 10, 1980, Ser. No. 205,506
Claims priority, application Austria, Nov. 15, 1979, 7301/79
Int. Cl.³ B28B *3/14*
U.S. Cl. 264—101 10 Claims



1. In a process for hot briquetting particulate organic solid materials selected from the group consisting of brown coal and bituminous coal which includes drying and heating the materials in a treatment zone under superatmospheric pressure by treatment at temperatures exceeding 160° C. with a fluid selected from the group consisting of hot water and steam thereby generating steam, discharging the materials from the treatment zone, separating steam from the materials and pressing the materials into briquettes while maintaining a temperature exceeding 160° C., the improvement comprising exposing the materials after discharging from the treatment zone and before pressing to sub-atmospheric pressure to thereby separate steam from the materials and sucking off the steam.

4,360,488

REMOVAL OF SOLVENT FROM GELS OF POLY(HYDROXYBUTYRATE) AND SHAPED ARTICLES FORMED THEREFROM

Peter J. Barham, Southmead, and Alan Selwood, Darlington, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 4, 1980, Ser. No. 174,836
Claims priority, application United Kingdom, Aug. 13, 1979, 7928172
Int. Cl.³ D01D *5/12*
U.S. Cl. 264—210.1 7 Claims

1. A process comprising forming a gel from a solution of poly(hydroxybutyrate) in a poor solvent and subjecting the gel to a non-random deformation process.

4,360,489

PROCESS FOR ADDING MAGNESIUM OXIDE TO FILM FORMING VINYLIDENE CHLORIDE COPOLYMER COMPOSITIONS

Martin H. Tusim, Fresno, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1981, Ser. No. 230,913
Int. Cl.³ B29B *1/04*; B29F *3/02*
U.S. Cl. 264—211 5 Claims

1. An improved process for preparing extruded vinylidene chloride copolymer film, said film being generally free from bubbles, holes and white specks, the film being derived from a composition comprising an amount of a dry, particulate, generally plasticizer-free, normally crystalline vinylidene chloride polymer having polymerized therein from about 70 to about 95 percent by weight, based on the weight of polymer, of vinylidene chloride and from about 30 to about 5 percent by weight, based on the weight of polymer, of at least one monoethylenically unsaturated monomer copolymerized therewith, and a heat stabilizing amount of magnesium oxide, the composition being processed into a film by conventional techniques, wherein the improvement comprises:

(a) forming an admixture of the magnesium oxide and the ethylene-vinylalkanoate copolymer dispersing agent by:

(i) physically mixing from about 1 to about 50 percent by weight, based on weight of the admixture, of the magnesium oxide powder and from about 99 to about 50 percent by weight, based on weight of the admixture, of the ethylene-vinyl alkanoate copolymer;

(ii) admixing the physically mixed magnesium oxide powder and ethylene-vinylalkanoate copolymer with a high shear mixing means, while the ethylene-vinylalkanoate copolymer is in a melt state, to disperse the Group II metal oxide powder in the ethylene-vinylalkanoate copolymer dispersing agent so that greater than 95 percent by weight, based on magnesium oxide weight, of the magnesium oxide powder has a particle size of less than about 0.5 square millimeter, preferably less than about 0.25 square millimeter; and

(iii) extruding the result of step (ii) in a form that will permit cutting or grinding that which is extruded into particles or pellets having a diameter of no more than about 0.125 inches and a length of no more than about 0.125 inches; and

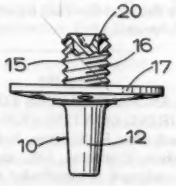
(b) mixing and extruding the vinylidene chloride copolymer particles with a sufficient amount of the admixture, the sufficient amount being that amount of the admixture which will yield an extrudate containing from about 0.05 to about 1.0 percent by weight, based on extrudate weight, of the magnesium oxide powder.

4,360,490

STUDS FOR FOOTWEAR AND METHOD OF MAKING SAME

Roy S. Collins, Sutton Coldfield, England, assignor to Triman Limited, Tamworth, England

Filed Aug. 16, 1979, Ser. No. 66,879
Claims priority, application United Kingdom, Aug. 16, 1978, 33483/78
Int. Cl.³ B29C *19/00*
U.S. Cl. 264—249 9 Claims



1. A method of making a stud for footwear, the stud comprising a support made of plastics material and a metal pin element, the support comprising an externally screw-threaded sleeve, for engagement with an internally screw-threaded socket in an article of footwear, and an outwardly directed flange for engagement with the lower end of the socket or with the underside of the article of footwear, and the pin element comprising a stem and a ground-engaging head, and the method comprising the steps of inserting the stem into the

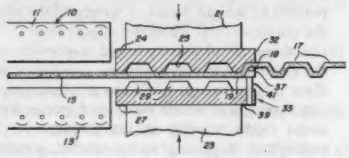
sleeve of the support and deforming the stem after insertion to secure the support and the pin element permanently together prior to engagement of said support with said internally screw-threaded socket.

4,360,491

FLOATING REMOLDING SHOES FOR FOAM THERMOFORMING MOLDS

Morell J. Holden, Jr., Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 9, 1981, Ser. No. 242,007
Int. Cl.³ B29C *17/00, 1/00;* B29D *27/00*
U.S. Cl. 264—294 **13 Claims**



1. In the high-speed thermoforming of articles from a heat-softened thermoplastic sheet by:

(1) a reciprocative thermoforming cycle comprising reciprocative opening and closing of a molding machine, having mold cavities and opposed mold plugs supported by a pair of platens, to form a plurality of molded articles between said cavities and said plugs, said articles having a selected thermoformed depth, and

(2) intermittent forward indexing of said sheet after each said reciprocative opening in order to remove said plurality of molded articles from said machine, whereby a rearmost portion of at least one said molded article is substantially adjacent to said machine after said indexing and is:

(a) potentially distorted in shape by machine-direction orientation stresses after said reciprocative opening and during said indexing, so that said rearmost portion is apt to be deformed before said next thermoforming cycle begins, and

(b) subject to tensile stresses occurring in the plane of said sheet during the interval between the time that said mold cavities contact one surface of said sheet and the time that said mold plugs reach their full closed position, said tensile stresses being transmitted as stretching forces that tend to draw said rearmost portion toward said adjacent machine and thereby cause distortion of said rearmost portion,

a shape-preserving method for remolding said rearmost portion by exerting a selected clamping pressure upon said rearmost portion, beginning as said forward indexing is completed and ending before the next forward indexing is begun after the next reciprocative opening.

4,360,492

METHOD OF AND APPARATUS FOR LUBRICATING CABLE DURING CONTINUOUS DRY CURING

Bobby A. Rowland; Roy E. Sullivan, both of Carrollton, Ga.; William R. Dodson, Ranburne, Ala., and Steve C. Bohannon, Newnan, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Nov. 5, 1980, Ser. No. 204,095
Int. Cl.³ B29D *3/00;* B29H *5/07*
U.S. Cl. 264—40.1 **8 Claims**

1. A method of continuously fabricating finished electrical conductor comprising the steps of:

(a) advancing an elongated electrical conductor along a predetermined straight path through a first extruder head;

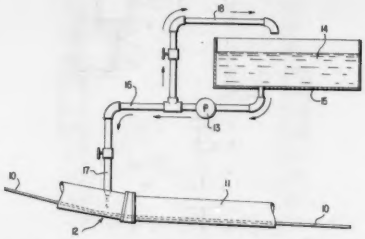
(b) concentrically extruding semiconductor strand shield onto said advancing conductor;

(c) advancing said shielded conductor along a predetermined straight path through a second extruder head in tandem relationship with said first extruder head;

(d) concentrically extruding primary insulation onto said advancing shielded conductor in a first extrusion plane within said second extruder;

(e) simultaneously and concentrically extruding an insulation shield onto said shielded and insulated conductor in a second extrusion plane within said second extruder;

(f) advancing said shielded, insulated and insulation shielded conductor along a predetermined substantially catenary path through a pressurized vulcanization means in tandem relationship with said second extruder head such that said shielded, insulated and insulation shielded conductor contacts the interior surface of said vulcanization means at a point remote from said second extruder head;



(g) simultaneously curing the strand shield, insulation and insulation shield of said conductor in a hot, dry medium within said vulcanization means;

(h) introducing lubricant into said vulcanization means under pressure at the point where said conductor contacts the interior surface of said vulcanization means;

(i) cooling said conductor when cured within said vulcanization means in an environment substantially free of water or other liquid coolant to form a finished electrical conductor;

(j) removing finished electrical conductor from said vulcanization means; and

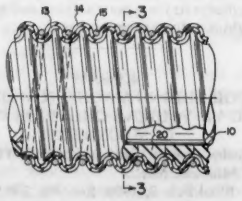
(k) collecting the finished electrical conductor on a cable storage means.

4,360,493

FLEXIBLE CORRUGATED RUBBER TUBING OF DUAL COMPOSITION

Vance M. Kramer, Sr., 2341 Townley Rd., Toledo, Ohio 43614, and Vance M. Kramer, Jr., 1913 Greendale Ave., Findlay, Ohio 45840

Filed Jul. 9, 1981, Ser. No. 281,867
Int. Cl.³ B29D *23/03;* B29C *17/04*
U.S. Cl. 264—506 **17 Claims**



1. A process for making two-ply, flexible, corrugated tubing from at least two extruded sleeves of uncured rubber, including a first sleeve of one diameter and a second sleeve having an

inner diameter approximately the same as the outer diameter of said first sleeve,

positioning said first sleeve of uncured rubber over an elongated internal forming member by sliding said sleeve in an axial direction over said forming member,

positioning a second sleeve of uncured rubber over said first sleeve by sliding said second sleeve in an axial direction over said first sleeve;

forming corrugations in said superimposed sleeves and thereby interlocking said sleeves to form a corrugated tubular element, and

heat-treating said corrugated tubular element to set said corrugations and form a flexible corrugated tube length having a wall having at least two plies.

4,360,494

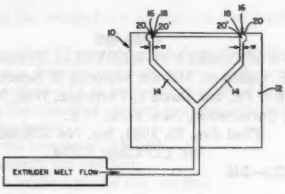
PROCESS FOR REDUCING MELT FRACTURE DURING EXTRUSION OF A MOLTEN NARROW MOLECULAR WEIGHT DISTRIBUTION, LINEAR, ETHYLENE COPOLYMER

Stuart J. Kurtz, Martinsville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 1, 1981, Ser. No. 249,914

Int. Cl.³ B29D *23/04*

U.S. Cl. 264—564 **13 Claims**



1. A process for reducing melt fracture formed during extrusion of a molten narrow molecular weight distribution, linear, ethylene polymer, under conditions of flow rate and melt temperature which would otherwise produce higher levels of melt fracture which comprises extruding said polymer through a die having a discharge outlet defining an exit die gap formed by opposing die lip surfaces and wherein one surface of the die lip and/or die land in contact with the molten polymer extends beyond the opposing surface of the die lip and/or die land in the direction of the axis of flow of the molten polymer through the die exit, said extended die lip having a groove extending around said extended die lip, said groove being disposed opposite the surface of the opposing die lip whereby melt fracture is reduced on the surface of the film leaving the extended die lip surface.

4,360,495

TARGET ARRANGEMENT FOR SPALLATION-NEUTRON-SOURCES

Gunter Bauer, Inden, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 95,103

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850069

Int. Cl.³ G21G *1/10*

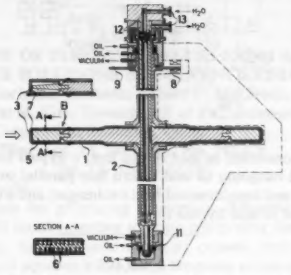
U.S. Cl. 376—151 **5 Claims**

1. The target arrangement for spallation-neutron sources wherein a horizontal proton beam continuously impinges on the target, the arrangement comprising:

a wheel having an annular volume of target material arranged thereon having an outer periphery upon which the beam impinges, a jacket overlying the target material in spaced relation thereto, and a window of low mass number metal joining the jacket and overlaying the outer periphery of the target material in spaced relation with respect thereto;

shaft means for mounting the wheel to rotate in one direction about a vertical axis perpendicular to the horizontal proton beam with the target material positioned in intersection with the proton beam, and

means for cooling the target material with a liquid coolant from a coolant source, the cooling means comprising: a plurality of grooves on the upper and lower surfaces of the target material, the grooves in one of the surfaces following involute curves which advance away from the direction of rotation of the wheel as the curves progress toward the periphery of the wheel and the grooves in the other surface following involute curves which advance toward the direction of rotation of the wheel as the curves progress toward the periphery of the wheel, the grooves communicating with the space between the window and periphery of the target material whereby liquid coolant flows from the grooves which advance away from the direction of rotation to the space between the window and outer periphery and then through the grooves which advance toward the direction of rotation while being confined by the jacket, the cooling means further including inlet and outlet means concentric with the shaft and connected to the grooves and the source of liquid coolant said grooves being of substantial equal lengths to provide for uniform heat removal from the entire target material.



4,360,496

COOLING SYSTEM FOR AUXILIARY SYSTEMS OF A NUCLEAR INSTALLATION

Wolfgang Märker, Heroldsbach; Klaus Müller, Röttenbach, and Wilhelm Roller, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jun. 23, 1980, Ser. No. 162,062

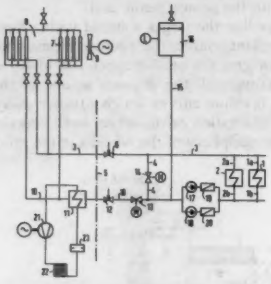
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927418

Int. Cl.³ G21C *9/00*

U.S. Cl. 376—298 **4 Claims**

1. Cooling system for auxiliary systems of a nuclear installation for heat removal from heat exchangers, the heat exchangers being connected on the primary side thereof to lines which may contain radioactive liquids or gases, the heat exchangers being disposed within a containment wall in a secured area of the nuclear installation, and the heat exchangers having connections on the secondary side thereof for cooling liquid lines, the improvement comprising an outgoing line for the cooling liquid connected to the connection on the secondary side of the heat exchangers, additional external heat exchangers being disposed outside of the containment wall and having an inlet and an outlet side, said inlet side of said additional heat exchangers being connected to said outgoing line, a return line for the cooling liquid being connected to said outlet side of said additional heat exchangers, said additional heat exchangers

being in the form of a dry cooling tower having cooling elements connected to said outgoing and return lines on the inlet and outlet sides thereof, respectively, a refrigeration loop having a supplemental heat exchanger with the primary side



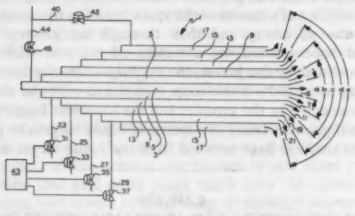
thereof connected in said return line, a bypass line connected from said outgoing to said return line parallel to said cooling elements and supplemental heat exchanger, and a control valve connected in said bypass line.

4,360,497

FEEDSTOCK NOZZLE AND USE IN CARBON BLACK REACTOR

John R. Casperson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 24, 1981, Ser. No. 257,040
Int. Cl.[3] C09C *1/48;* B01J *10/00*
U.S. Cl. 422—156 5 Claims



1. A carbon black reactor feedstock nozzle comprising:
(a) a central pipe with a diverging nozzle outlet,
(b) multiple concentric annuli surrounding said central pipe each annulus having a diverging nozzle outlet with a spray angle different from the other annuli and means for supplying a separate, controlled supply of inlet material to each annulus and
(c) means for a seriatim cycling of feedstock flow to at least two of said multiple concentric annuli.

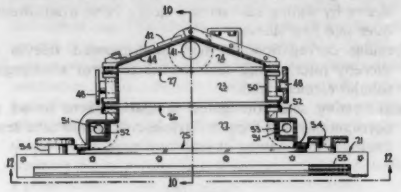
4,360,498

SECTIONAL LINED END BOX FOR CHEMICAL CELL

Robert O. Herder, Rte. 4, Box 510, Baileys Neck Rd., Easton, Md. 21601

Filed Apr. 14, 1981, Ser. No. 254,101
Int. Cl.[3] B01J *19/02*
U.S. Cl. 422—241 7 Claims

1. An end box for a cell subject to highly corrosive chemicals, said end box being generally in the form of a housing is divided into plural chambers by internal baffles, the said baffles within said housing by their design provide openings into various ones of said chambers; the improvement of said housing being formed in a plurality of sections each separated from one another by one of sid baffles, each of said housing sections having a connecting flange for joining of said sections, and each baffle having a peripheral edge portion disposed between flanges of adjacent housing sections that facilitate the individual removal and replacement of said baffles, each of said baffles



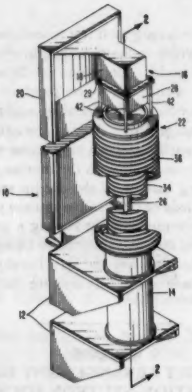
including said peripheral edge portion thereof being lined with a resilient corrosion-resistant coating, and said coating on said baffle edge portions forming a gasket means for sealing said baffles to said housing sections.

4,360,499

BELLOWS ASSEMBLY FOR CRYSTAL RIBBON PULLER

Nicholas F. Gubitose, Moosic; Malcolm R. Schuler, Mountaintop, both of Pa., and David L. Patterson, Wall, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 22, 1981, Ser. No. 275,606
Int. Cl.[3] C30B *15/34*
U.S. Cl. 422—246 6 Claims

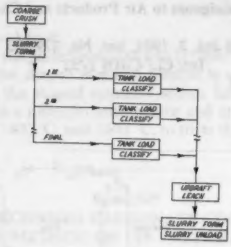


1. Apparatus for growing a ribbon of crystalline material, said apparatus comprising a furnace adapted to contain a melt from which the ribbon is to be grown, crystal pulling means spaced from said furnace, said crystal pulling means including a crystal seed holding means and sliding means on which said crystal seed holding means is carried for moving said crystal seed toward and away from said furnace, inner and outer bellows means extending between and being sealed to said furnace and said crystal pulling means such that both bellows means expand and contract in response to motion of said crystal pulling means, said outer bellows means surrounding said inner bellows means and being spaced therefrom, gas inlet means communicating with the space between said first and second bellows means and gas outlet means also communicating with said space.

4,360,500
MINERAL LEACHING

Anderson B. Fly, 1406 N. Roosevelt, Amarillo, Tex. 79107

Filed Sep. 12, 1977, Ser. No. 832,088
Int. Cl.³ B01D *11/00*; B01F *1/00*
U.S. Cl. 423—1 25 Claims

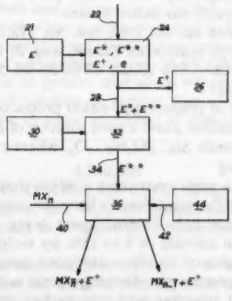


1. The method of extracting leachable minerals from ore comprising:
(a) crushing the ore, then
(b) forming a fresh slurry with the crushed ore and a liquid, then
(c) pumping the crushed ore into an ore tank having liquid, and
(d) forming a bed of crushed ore below the liquid, then
(e) classifying the ore bed into strata, with a stratum of course ore below of at least one stratum of fine ore, then
(f) leaching the classified ore bed in a quiescent condition by circulating liquid
(i) from the bottom of the tank,
(ii) up through the ore bed,
(iii) into a stratum above the ore bed,
(iv) through a recovery system, and
(v) back to the bottom of the tank.

4,360,501
METHOD OF ISOTOPE SEPARATION

Roger Bir, Vanves, and Jean-Pierre Schermann, Paris, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 889,537, Mar. 23, 1978, abandoned.
This application Nov. 2, 1979, Ser. No. 90,741
Claims priority, application France, Mar. 29, 1977, 77 09366
Int. Cl.³ B01D *59/00*
U.S. Cl. 423—3 6 Claims



1. A method of isotope separation which consists in carrying out the irradiation of a molecular isotopic mixture composed of molecules of the type ^1MX_n and ^2MX_n where ^1M and ^2M are two isotopic species of the atom M with a beam of monochromatic laser light with energy $h\nu$ in resonance with the energy difference between two vibrational levels of an isotopic species of molecules ^1MX_n and the molecules ^1MX_n and ^2MX_n are then also caused to interact with the atoms of a neutral gas E in superactivated form, wherein said interaction is carried out in the so-called Rydberg state E** in order to convert said molecules to negative ions by capture of the electrons released by the Rydberg atoms in accordance with the reactions:

$$^1MX_n + h\nu \rightarrow {}^1MX_n^*$$

$$E^{**} \rightarrow E^+ + e^-$$

$$^1MX_n^* + e^- \rightarrow {}^1MX_{n-1}^- + X$$

$$^2MX_n + e^- \rightarrow {}^2MX_n^-$$

4,360,502
RECOVERY OF TUNGSTEN VALUES FROM ALKALI TUNGSTATE SOLUTIONS BY SOLVENT EXTRACTION

Martin B. MacInnis, Towanda; Robert P. McClintic, Monroeton, and Tai K. Kim, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 13, 1981, Ser. No. 292,378
Int. Cl.³ C01G *41/00*
U.S. Cl. 423—54 1 Claim

1. A process for producing ammonium tungstate from an aqueous alkali metal tungstate solution comprising the steps of: (a) extracting tungsten values into an organic extractant by contacting said aqueous alkali metal tungstate solution solution with said organic extractant for a sufficient period of time to form a loaded organic extractant containing said tungsten values and an aqueous solution said organic extractant consisting essentially of from about 6 to about 10 percent by volume of a mixture of tri-alkyl amines having alkyl chains of about 6 to about 10 carbon atoms with trisooctyl amine being the major component in said mixture and from 90 to 94 percent by volume of an aromatic solvent consisting essentially of a mixture of alkyl benzenes wherein the alkyl benzenes constituting the mixture of alkyl benzenes have molecular weights of 120, 134, 148 and the total number of atoms in the alkyl chains attached to the benzene ring are either 3, 4, or 5; (b) separating said loaded organic extractant from said aqueous solution; (c) stripping said loaded organic extractant from step (b) by contacting with an aqueous ammonia solution to form an aqueous ammonium tungstate solution and a stripped organic extractant, said stripping being carried out by maintaining said organic extractant as a continuous phase with the aqueous ammonia solution dispersed therein and volume ratio of organic extractant to aqueous ammonia solution at a ratio of from about 7.0 to about 3.5 to one, (d) separating said aqueous ammonium tungstate from said stripped organic extractant by feeding said aqueous ammonium tungstate and said organic extractant into a container, said container including a pair of electrodes and applying a direct current voltage potential across said electrodes for promoting coalescence of said aqueous and organic phase; (e) separating said aqueous phase and said organic phase comprising stripped organic extractant; and (f) feeding said stripped organic extractant to step (a) for use as said organic extractant.

4,360,503
RECOVERY OF TUNGSTEN VALUES FROM ALKALI TUNGSTATE SOLUTIONS BY SOLVENT EXTRACTION

Carl W. Boyer, Wyalusing; James N. Christini, Towanda, and Martin C. Vogt, Monroeton, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 13, 1981, Ser. No. 292,380
Int. Cl.³ C01G *41/00*
U.S. Cl. 423—54 2 Claims

1. A process for producing ammonium tungstate from an aqueous alkali metal tungstate solution containing impurities comprising the steps of: (a) extracting said tungsten values into an organic extractant by contacting said aqueous alkali metal tungstate solution with said organic extractant for a sufficient

period of time to form a loaded organic extractant containing tungsten values and an aqueous solution containing a portion of said impurities, said organic extractant consisting essentially of from about 6 to about 10 percent by volume of a mixture of tri-alkyl amines having alkyl chains of about 6 to 10 carbon atoms with tri-isoctyl ammine being the major component in said mixture and from 90 to 94 percent by volume of an aromatic solvent consisting essentially of a mixture of alkyl benzenes wherein the alkyl benzenes constituting the mixture of alkyl benzenes have molecular weights of 120, 134, 148 and a total number of atoms in the alkyl chains attached to the benzene ring are either 3, 4, or 5; (b) separating said loaded organic extractant from said aqueous solution containing a portion of said impurities; (c) stripping said loaded organic from step (b) by contacting with an aqueous ammonia solution to form an aqueous ammonium tungstate solution and a stripped organic extractant, said contacting being carried out by dispersing said aqueous ammonia solution in said loaded organic extractant wherein said organic extractant forms a continuous phase with said aqueous ammonia solution being dispersed therein as a discontinuous aqueous phase and the volume ratio of said aqueous ammonia to said organic extractant is from about 7 to 1 to about 3.5 to 1, (d) separating said ammonium tungstate from said stripped organic extractant; and (e) washing said stripped organic to form a wash solution comprising from about 1 to about 4 percent by weight ammonia and less than about one percent by weight tungstate, adding concentrated ammonia solution to form an aqueous ammonia solution having from about 6 to about 8 weight percent ammonia, and adding ammonium tungstate from step (d) to form a strip solution having an ammonium concentration of from about 6 to about 10 percent and a tungstate concentration of from 1 to about 6 percent, (e) feeding said strip solution to step (c) for stripping, and (f) feeding one portion of said stripped organic extractant to step (a) for use as said organic extractant and another portion to step (c) for maintaining said ratio of aqueous organic to organic extractant.

4,360,504

SIMULTANEOUS DESTRUCTION OF TRACE COMPONENTS IN THE REACTION OFF-GAS FROM THE SYNTHESIS OF MELAMINE

Klaus Blanck, Heidelberg; Winfried Dethlefsen, Mannheim; Anton Jungbauer, Ludwigshafen; Bernd Leutner, Frankenthal; Ernst-Juergen Schier, Altleiningen; Hans-Ulrich Schlimper, Speyer, and Hans H. Schneehage, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 307,669

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041324

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—236 **8 Claims**

1. A process for the simultaneous destruction of the trace components hydrogen cyanide, isocyanic acid, urea and melamine in the reaction off-gas, consisting mainly of ammonia and carbon dioxide, which are left after thermal conversion of urea to melamine and isolation of the melamine, wherein the off-gas is passed over a catalyst, containing copper oxide and/or iron oxide, in the presence of steam at from 100° to 500° C.

4,360,505

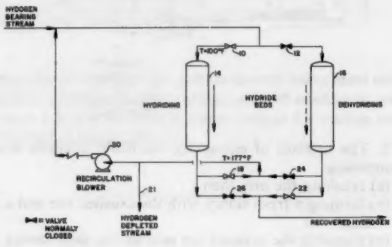
RECOVERING HYDROGEN FROM GAS STREAM USING METAL HYDRIDE

John J. Sheridan, III, Somerville, N.J.; Fred G. Eisenberg, Allentown, Pa.; Gary D. Sandrock, Ringwood, N.J.; Ernest L. Huston, Tuxedo; Edwin Snape, Suffern, both of N.Y.; Raymond P. Stickles, Concord, and Gordon C. Cheng, Carlisle, both of Mass., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 2, 1981, Ser. No. 279,883

Int. Cl.³ C01B *1/32*

U.S. Cl. 423—248 **12 Claims**



1. A rapid cycling process for separating hydrogen from a gas mixture which comprises:

(a) passing a gas mixture containing hydrogen through a bed containing an intimate composite of hydridable material and inert thermal ballast under conditions such that the composite moves from an initial hydrogen pressure, hydrogen concentration and temperature (P_1, C_1, T_1) to a final hydrogen pressure, hydrogen concentration and temperature (P_2,C_2,T_2) and P_2 is greater than P_1, C_2 is greater than C_1 and C_2–C_1 represents at least 50% of the theoretical hydriding capacity and T_2 is greater than T_1, said ballast being incorporated in an amount such that the composite can absorb at least 50% of the theoretical energy of hydride formation; and

(b) desorbing hydrogen from the bed by reducing the pressure and utilizing the energy of hydride formation to aid in desorption.

4,360,506

METHOD OF PREPARING SIALON PRODUCTS

Rene A. Paris, Lyons, and Therese Grollier-Baron, Ecully, both of France, assignors to Societe Europeenne des Produits Refractaires, Neuilly-sur-Seine, France

Filed Jul. 30, 1980, Ser. No. 173,746

Claims priority, application France, Aug. 3, 1979, 79 19986

Int. Cl.³ C01B *33/26;* C04B *35/58, 35/64*

U.S. Cl. 423—327 **12 Claims**

1. A method of preparing β'-sialon products which contain as a single crystalline phase a solid solution of β'-sialon having the general formula $Si_{6-z}Al_zN_{8-z}O_z$, where z=1 to 4, by the steps comprising

(1) forming a paste containing a silico-aluminous material, carbon and fine particles of a ligneous pore-forming agent; said ligneous pore-forming agent being present in said paste in an amount of 8 to 18% by weight of the combined weights of the silico-aluminous material, the carbon and the ligneous pore-forming agent; said carbon, when considered together with the carbon contained in the ligneous pore-forming agent, being present in said paste in an amount at least equal to the stoichiometric amount needed for satisfying the equation:

$$\frac{Z}{2}\,Al_2O_3 + (6 - Z)SiO_2 +$$

-continued

$$\frac{(8-Z)}{2}N_2 + \left(12 - \frac{3}{2}Z\right)C \longrightarrow$$

$$Si_{6-Z}Al_ZN_{8-Z}O_Z + \left(12 - \frac{3}{2}Z\right)CO$$

where Z=1 to 4;

(2) forming the paste formed in step (1) into shaped elements;

(3) drying the shaped elements formed in step (2); and,

(4) heating the shaped elements which have been dried in step (3) in a nitrogen atmosphere and at temperatures of between 1400° C. and 1600° C. to form the β'-sialon products.

4,360,507

SODIUM ZIRCONIUM CARBONATE COMPOUND AND THE METHOD OF ITS PREPARATION

Mary J. McArthur, Simi Valley; Laurence B. Marantz, Sherman Oaks, and Abb L. Scarbrough, Calabasas, all of Calif., assignors to Organon Teknika Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 5,671, Jan. 24, 1979, Pat. No. 4,256,718, which is a continuation-in-part of Ser. No. 890,650, Mar. 20, 1978, abandoned. This application Nov. 18, 1980, Ser. No. 207,842

The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.

Int. Cl.[3] **C01B** *31/24;* **C01D** *7/00;* **C01G** *25/00*

U.S. Cl. 423—419 P **39 Claims**

7. The method for the preparation of a particulate sodium zirconium carbonate hydrate product having a substantially non-uniform particle size and an ionic composition corresponding to analysis, exclusive of water of hydration, as follows:

$$(NA)_A(Zr)_B(CO_3)_C$$

wherein, when B, determined as ZrO_2 is assigned the value 1, A has a value of from about 0.8 to about 1.2, and C, determined as CO_2, has a value of from about 0.8 to about 1.2, said method comprising the steps of:

(a) preparing a metastable solution comprising zirconium, sodium, sulfate and carbonate ions and having a pH of from about 8 to about 11.5, the molar ratios of said sodium, sulfate and carbonate ions to each zirconium ion in said solution being within the ranges of from about 6 to about 10, from about 2 to about 3 and from about 2 to about 4 respectively and the concentration of said zirconium ions in said solution being from about 0.3 molar to about 0.9 molar, wherein said solution may further comprise chloride ions which when present do not exceed a molar ratio of about 2 chloride ions to one zirconium ion;

(b) heating said metastable solution about 0.3° to about 0.5° C. per minute to greater than about 90° C; and

(c) holding said solution at greater than about 90° C. for sufficient time to allow formation of said product.

4,360,508

TREATMENT OF EFFLUENTS

Frederick Farrington, and Peter S. Clough, both of Stretford, England, assignors to British Gas Corporation, London, England

Continuation of Ser. No. 136,988, Apr. 3, 1980, which is a continuation of Ser. No. 949,568, Oct. 10, 1978. This application Mar. 12, 1981, Ser. No. 243,036

Claims priority, application United Kingdom, Oct. 13, 1977, 42647/77

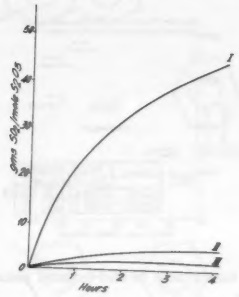
Int. Cl.[3] **C01B** *17/04, 17/16;* **C01D** *5/02*

U.S. Cl. 423—544 **8 Claims**

1. In a process for the conversion of soluble thiosulphate to sulphates, said thiosulphates being present in an aqueous redox solution comprising at least one salt of an anthraquinone di-sulphonic acid and at least one water soluble vanadium compound, which process comprises introducing sulfuric acid, as such or as oleum, into a deep vessel containing a deep body of said thiosulphate-containing redox solution, the improvement wherein:

the sulfuric acid introduced has a concentration of from 10–98% w/w H_2SO_4;

the amount of sulfuric acid introduced into said deep vessel is such that the gram molecular weight ratio of sulfuric acid to thiosulphate is from 1:2 to 1:3;



introducing the sulfuric acid into the base of said vessel and into the bottom of the deep body of said redox solution therein;

maintaining the contents of said vessel at a temperature of from 70° C. up to the boiling point of the redox solution;

maintaining said vessel at ambient pressure; and

thereafter separating the sulphate formed, whereby the generation of SO_2 is not more than 10 grams per mole of thiosulphate present in said aqueous redox solution, and whereby not more than 20% of said thiosulphate remains in said aqueous redox solution after not more than 3½ hours.

4,360,509

VIVO RADIOASSAY PROCESS

Wilhelmus T. Goedemans, Schoorl, Netherlands, assignor to Byk-Mallinckrodt CIL B.V., Netherlands

Filed Dec. 19, 1979, Ser. No. 105,202

Int. Cl.[3] **A61K** *49/00, 43/00*

U.S. Cl. 424—1 **7 Claims**

1. A method for radioassaying a warmblooded animal to locate an inflammatory reaction which comprises providing in the bloodstream of said animal a small amount of a radioactive indium-8-hydroxyquinoline sufficient to form indium-radioactive blood components in said animal for detection by external imaging, and subjecting said animal to external imaging for detecting accumulated radioactivity in an inflamed area to determine its location in the body of said animal.

4,360,510

METHOD FOR SCREENING ANTI-TUMOR AGENTS OF THE RETICULO-ENDOTHELIAL STIMULANT CLASS

Julian W. Proctor, 232 Village in the Park, 3000 Marshall Rd., Pittsburgh, Pa. 15214

Filed Nov. 30, 1979, Ser. No. 99,001

Int. Cl.[3] **A61K** *43/00;* **A61N** *5/12*

U.S. Cl. 424—1.5 **4 Claims**

1. A method for determining the anti-tumor activity of an agent of the reticulo-endothelial stimulant class comprising the sequential steps of:

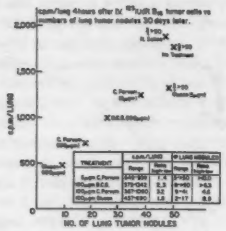
(1) administering predetermined doses of an anti-tumor

agent of the reticulo-endothelial stimulant class to a rodent, by a suitable route of administration;

(2) at between 2 and 60 days, thereafter, administering a predetermined quantity of radiolabelled tumor cells, radiolabelled with a DNA label, to said rodent;

(3) allowing the administered radiolabelled tumor cells to build up in the lung and subsequently allowing at least about 50% of said cells to be lost from the lung of said rodent;

(4) isolating the lung tissue from said rodent and measuring the radioactivity emanating from the remaining radiolabelled tumor cells in said isolated piece of tissue; and thereafter



(5) calculating the increase in loss of said radioactivity from said isolated piece of lung tissue of a predetermined size from animals treated with said anti-tumor agent of the reticulo-endothelial stimulant class, compared with the loss of radioactivity from a piece of lung tissue of substantially the same predetermined size isolated from rodents receiving no or a placebo treatment, the increase representing an index of the magnitude of the anti-tumor effect observed.

4,360,511

AMINES USEFUL AS BRAIN IMAGING AGENTS

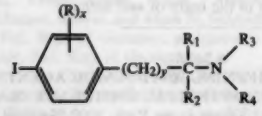
Ronald M. Baldwin, San Francisco; Tz-Hong Lin, Fremont, and Harry S. Winchell, Lafayette, all of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

Continuation of Ser. No. 964,561, Nov. 29, 1978, abandoned. This application Jun. 19, 1980, Ser. No. 161,097

Int. Cl.³ A61K *49/00, 43/00*

U.S. Cl. 424—1.5 **14 Claims**

1. A radioiodinated amine of the formula:



wherein I is a radioisotope of iodine, R is lower alkyl or halogen; R_1 is hydrogen or lower alkyl; R_2 is lower alkyl; R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, alkyl, aryl, substituted aryl, aralkyl, substituted aralkyl and carbamoylmethyl or R_3 and R_4 taken together with the nitrogen to which they are attached form a 5- or 6-membered ring which may be substituted with one or more lower alkyl groups, and x is 0 to 4 and y is 0 to 3.

4,360,512

NONABRASIVE GEL FORMULATIONS OF SULFONATED POLY(ARYLENE ETHER SULFONE) POLYMER DENTAL PLAQUE BARRIERS

James D. Vidra, Clinton, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.

Filed Jul. 25, 1980, Ser. No. 172,350

Int. Cl.³ A61K *7/16, 7/22, 31/315, 31/185*

U.S. Cl. 424—56 **6 Claims**

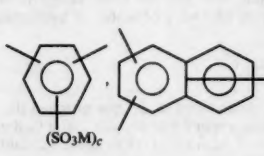
1. An oral hygiene composition for preventing the deposition of bacterial plaque on teeth, which comprises water, at least about 5% by weight of a humectant selected from the group consisting of glycerol and sorbitol, at least about 16% by weight of a gelling agent selected from the group consisting of the block copolymers of polyoxypropylene and polyoxyethylene wherein the polyoxypropylene component has a molecular weight in the range of from about 3,000 to about 4,000 and the polyoxyethylene comprises between about 25 and about 80 mole % of said copolymer, and from about 0.5 to about 10% by weight of a plaque barrier agent, which is a sulfonated poly(arylene ether sulfone) polymer having repeating units selected from the group consisting of structure (A),

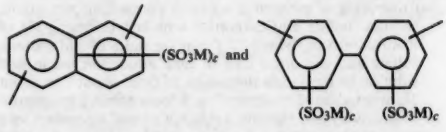
$$+Ar_1-SO_2-Ar_2-O+ \quad (A)$$

and structure (B),

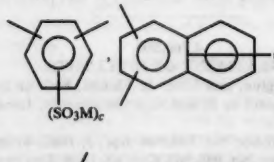
$$+Ar_1-SO_2-Ar_2-O-Ar_3-O+ \quad (B)$$

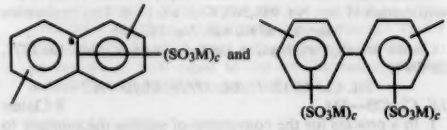
wherein Ar_1 and Ar_2 are each selected from



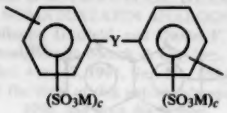


provided further that Ar_2 also can comprise one or more spacing units selected from —Ar_4—SO_2—Ar_4— and —Ar_4—SO_2—Ar_4—SO_2—Ar_4—, each Ar_4 in said spacing units being separately selected from:

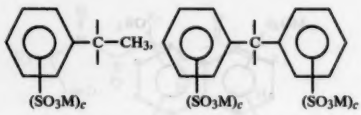




Ar_3 is selected from Ar_4 and:



where Y is selected from lower alkylene having 1–5 carbon atoms, lower alkylidine having 2–5 carbon atoms,



O, S, and SO_2; subscript c being an integer selected from 0, 1, and 2, the average quotient obtained by dividing the sum of the c's within each of repeating units (A) and (B) by the number of aromatic groups in said repeating unit being at least about 0.2; and M is selected from the group consisting of lithium, sodium, potassium, calcium, magnesium, zinc, aluminum, hydrogen, ammonium, and substituted ammonium ions derived from pharmaceutically acceptable organic amines.

4,360,513

SULFONATED POLY(ARYLENE ETHER SULFONE) POLYMERS AS DENTAL PLAQUE BARRIERS

Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Jul. 25, 1980, Ser. No. 172,487
Int. Cl.³ A61K *7/16, 7/22, 31/315, 31/185*
U.S. Cl. 424—56 **6 Claims**

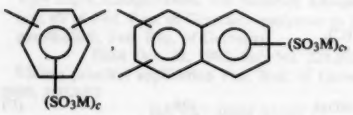
1. An oral hygiene composition comprising an effective amount for preventing deposition of dental plaque on teeth of a sulfonated poly(arylene ether sulfone) polymer having a weight average molecular weight of from about 5,000 to about 200,000 and repeating units selected from the group consisting of structure (A),

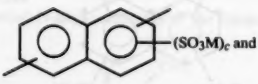
$$—Ar_1—SO_2—Ar_2—O— \quad (A)$$

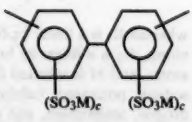
and structure (B),

$$—Ar_1—SO_2—Ar_2—O—Ar_3—O— \quad (B)$$

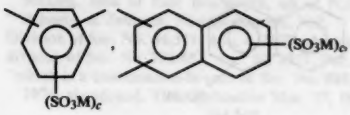
wherein Ar_1 and Ar_2 are each selected from

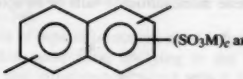


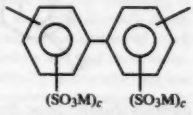




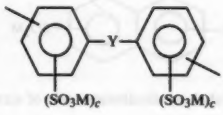
provided further that Ar_2 also can comprise one or more spacing units selected from $—Ar_4—SO_2—Ar_4—$ and $Ar_4—SO_2—Ar_4—SO_2—Ar_4—$, each Ar_4 in said spacing units being separately selected from



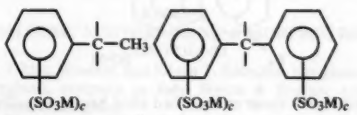




Ar_3 is selected from Ar_4 and



where Y is selected from lower alkylene having 1–5 carbon atoms, lower alkylidine having 2–5 carbon atoms,



O, S, and SO_2; subscript c being an integer selected from 0, 1, and 2, the average quotient obtained by dividing the sum of the c's within each of repeating units (A) and (B) by the number of aromatic groups in said repeating unit being at least about 0.2; and M is selected from the group consisting of lithium, sodium, potassium, calcium, magnesium, zinc, aluminum, hydrogen, ammonium, and substituted ammonium ions derived from pharmaceutically acceptable organic amines, in a pharmaceutically acceptable oral hygiene vehicle compatible with said polymer.

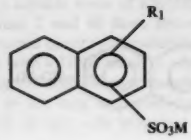
4,360,514

SULFONATED ALKYLNAPHTHALENES AS DENTAL PLAQUE BARRIERS

Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.

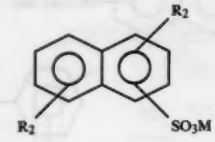
Filed Jul. 25, 1980, Ser. No. 172,488
Int. Cl.³ A61K *7/16, 7/22, 31/315, 31/185*
U.S. Cl. 424—56 **3 Claims**

1. An oral hygiene composition selected from the group consisting of mouthwashes, mouthrinses, irrigating solutions, abrasive gel dentifrices, non-abrasive gel dentifrices, denture cleansers, coated dental floss, coated interdental stimulators, chewing gums, lozenges, breath fresheners, foams and sprays consisting essentially of a therapeutically effective amount for preventing deposition of dental plaque on teeth of a salt of an alkylnaphthalene sulfonate selected from the group consisting of the monoalkylnaphthalene monosulfonate salts of structure (A),



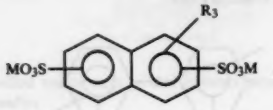
(A)

dialkylnaphthalene monosulfonate salts of structure (B),



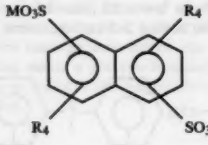
(B)

monoalkylnaphthalene disulfonate salts of structure (C),



(C)

and dialkylnaphthalene disulfonate salts of structure (D),



(D)

wherein R_1 is a linear or branched alkyl having 4 to 20 carbon atoms, R_2 is a linear or branched alkyl having 4 to 12 carbon atoms, R_3 is a linear or branched alkyl having 16 to 20 carbon atoms, R_4 is a linear or branched alkyl having 8 to 20 carbon atoms, and M is selected from the group consisting of lithium, sodium, potassium, calcium, magnesium, zinc, aluminum, ammonium and the substituted ammonium ions derived from pharmaceutically acceptable organic amines in a pharmaceutically acceptable oral hygiene vehicle compatible with said alkylnaphthalene sulfonate salt.

4,360,515

SULFONATED ALKOXYNAPHTHALENES AS DENTAL PLAQUE BARRIERS

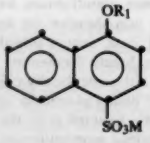
Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Jul. 25, 1980, Ser. No. 172,489

Int. Cl.[3] **A61K** *7/16, 7/22, 31/315;* **C07C** *143/24*

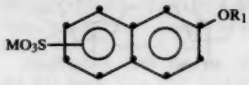
U.S. Cl. 424—56 **6 Claims**

1. An alkoxynaphthalene sulfonic acid compound having a structure selected from the group consisting of structure (A),



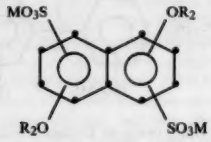
(A)

structure (B),



(B)

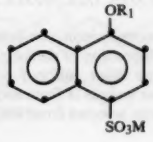
and structure (C),



(C)

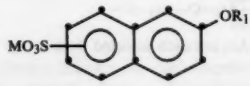
wherein R_1 is a linear or branched alkyl having 6 to 20 carbon atoms, R_2 is a linear or branched alkyl having 8 to 20 carbon atoms, and M is selected from the group consisting of hydrogen, lithium, sodium, potassium, calcium, magnesium, zinc, aluminum, ammonium and the substituted ammonium ions derived from pharmaceutically acceptable organic amines.

2. An oral hygiene composition comprising a therapeutically effective amount for preventing deposition of dental plaque on teeth of an alkoxynaphthalene sulfonic acid compound having a structure selected from the group consisting of structure (A),



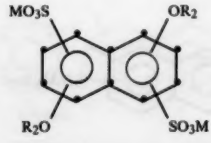
(A)

and structure (B),



(B)

and structure (C),



(C)

wherein R_1 is a linear or branched alkyl having 6 to 20 carbon atoms, R_2 is a linear or branched alkyl having 8 to 20 carbon atoms, and M is selected from the group consisting of lithium, sodium, potassium, calcium, magnesium, zinc, aluminum, hydrogen, ammonium, and substituted ammonium ions derived from pharmaceutically acceptable organic amines, in a pharmaceutically acceptable oral hygiene vehicle compatible with said polymer.

4,360,516

MODIFIED D-RETRO CYCLIC HEXAPEPTIDE SOMATOSTATIN ANALOGS

Roger M. Freidinger, Hatfield, and Daniel F. Veber, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

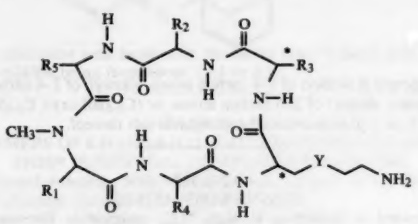
Filed Apr. 13, 1981, Ser. No. 254,010

The portion of the term of this patent subsequent to Jan. 12, 1998, has been disclaimed.

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 10 Claims

1. A compound having the formula:



wherein

Y is $(CH_2)_m$ wherein m is 0, 1 or 2 or sulfur such that the sulfur may be in any position along the chain;

R_1 and R_2 are independently lower alkyl, benzyl, substituted benzyl wherein the substituent may be one or two of loweralkyl, halogen, hydroxy, amino, nitro or loweralkoxy; and loweralkyl substituted with a 5- or 6-membered heterocyclic ring;

R_3 is 3-indolylmethyl or substituted 3-indolylmethyl wherein the substituent may be loweralkyl, loweralkoxy or halogen;

R_4 is loweralkyl, hydroxyloweralkyl, benzyl, carboxyloweralkyl, aminoloweralkyl or substituted hyroxy benzyl wherein the substituent may be loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro;

R_5 is hydrogen, loweralkyl, benzyl, or substituted benzyl wherein the substituent is loweralkyl, loweralkoxy, hydroxy, halogen, amino ornitro; and the two asymmetric centers marked with an asterisk (*) may be either D or L provided the two centers of asymmetry are not the same, while the other asymmetric centers are D.

4,360,517

N-METHYL-N-SILYL-CARBAMATES AND THEIR USE FOR COMBATING PESTS

Rolf-Dieter Acker, Leimen; Gerhard Hamprecht, Weinheim; Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

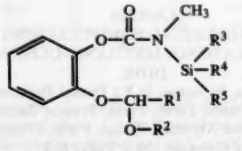
Filed Dec. 31, 1980, Ser. No. 221,832

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002603

Int. Cl.³ A01N *55/00*

U.S. Cl. 424—184 7 Claims

1. An N-methyl-N-silyl-carbamate of the formula



I

where R^1 is chloromethyl, R^2 is methyl or ethyl; R^3 is methyl or ethyl; R^4 is methyl, ethyl or propyl and R^5 is methyl, ethyl, propyl, butyl or phenyl.

4,360,518

TOPICAL ANTI-INFLAMMATORY DRUG THERAPY

David T. Rovee, Bridgewater; John R. Marvel, and James A. Mezick, both of East Brunswick, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 64,311, Aug. 6, 1979, abandoned, which is a division of Ser. No. 788,453, Apr. 20, 1977, Pat. No. 4,185,100, which is a continuation-in-part of Ser. No. 685,942, May 13, 1976, abandoned. This application Mar. 17, 1981, Ser. No. 244,569

Int. Cl.³ A61K *31/19*, *31/56*

U.S. Cl. 424—240 18 Claims

1. A method of topical treatment of an inflammatory condition of the skin comprising applying to the affected area a non-steroidal anti-inflammatory agent which is an inhibitor of prostaglandin synthetase selected from the group consisting of mefenamic acid and flufenamic acid, and, concurrently therewith, a topically active anti-inflammatory corticosteroid, each of said prostaglandin synthetase inhibitors and said corticosteroid being applied in a pharmaceutically acceptable topical vehicle selected from the group consisting of creams, gels, ointments, powders, aerosols and solutions suitable for topical administration, the amounts of said anti-inflammatory drugs being sufficient, in combination, to combat said inflammatory condition.

4,360,519

ANALGESIC METHOD USING A MORPHOLINE COMPOUND

Alan C. White, Windsor, and Edwin T. Edington, Cookham, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

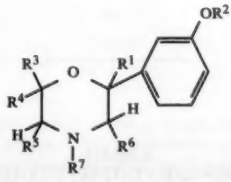
Filed Oct. 3, 1980, Ser. No. 193,779

Claims priority, application United Kingdom, Oct. 20, 1979, 7936502

Int. Cl.³ A61K *31/535*

U.S. Cl. 424—248.55 1 Claim

1. A method of treating a mammal in need of an analgesic or opiate antagonist which comprises administering to said mammal an analgesically or opiate antagonistically effective amount of a compound selected from the group consisting of a morpholine derivative of the formula:



and a pharmaceutically acceptable acid addition salt thereof, wherein R^1 represents lower alkyl; R^2 represents hydrogen, lower alkyl, benzyl, loweralkoxymethyl or an acyl group; R^3 represents hydrogen, lower alkyl or phenyl; R^4, R^5 and R^6 are independently hydrogen or lower alkyl and R^7 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, aryl(lower)alkyl, tetrahydrofurylmethyl or cycloalkylmethyl, with the proviso that R^2 may only be lower alkyl when R^7 is other than hydrogen or lower alkyl.

4,360,520

1,4-DIHYDROPYRIDAZINE COMPOUNDS, AND THEIR MEDICINAL USE

Horst Meyer; Gerhard Franckowiak; Friedrich Bossert; Arend Heise; Stanislav Kazda; Kurt Stoepel; Robertson Towart, all of Wuppertal, and Egbert Wehinger, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

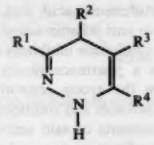
Filed Sep. 11, 1978, Ser. No. 941,527

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741260

Int. Cl.³ A61K *31/495;* **C07D** *237/04*

U.S. Cl. 424—250 **13 Claims**

1. A compound of the formula I



wherein

R^1 is a straight or branched alkyl radical with up to 6 carbon atoms optionally substituted by one substituent selected from fluoro, chloro or phenyl; or represents thienyl, furyl or phenyl, the phenyl optionally having 1 substituent from the group halogen, nitro, cyano, of hydroxyl,

R^2 represents phenyl, naphthyl, thienyl or furyl, the above mentioned phenyl optionally having 1 or 2 identical or different substituents selected from the group alkyl with 1 to 2 carbon atoms, alkoxy with 1 to 2 carbon atoms or halogen, or substituted by one of cyano, nitro, hydroxyl, trifluoromethyl or trifluoromethoxy;

R^3 is hydrogen or the group $COOR^6$, wherein R^6 is a straight-chain branched saturated or unsaturated aliphatic hydrocarbon radical having up to 6 carbon atoms, which is optionally interrupted in the chain by 1 oxygen atom and/or which is optionally substituted by hydroxyl, halogen, phenyl or phenoxy; or is cyclopentyl or cyclohexyl and

R^4 is alkyl with 1 to 4 carbon atoms, or fluoroalkyl with 1 or 2 carbon atoms, phenyl optionally substituted by nitro, or is thienyl or furyl.

9. A method of combating circulatory diseases in warm-blooded animals which comprises administering to the animals a cononary-dilating effective amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament according to claim **7**.

4,360,521

7[3,6-DIHYDRO-1(2H)-PYRIDYL]-2-OXO-2H-[1,2,4]OXADIAZOLO[2,3-C]PYRIMIDINE-5-CARBAMATE COMPOUNDS

Urs Hengartner, Basel, Switzerland; Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

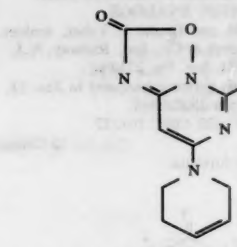
Filed Dec. 4, 1982, Ser. No. 327,384

Claims priority, application Switzerland, Dec. 19, 1980, 9410/80; Oct. 2, 1981, 6350/81

Int. Cl.³ C07D *498/22;* **A61K** *31/505*

U.S. Cl. 424—251 **12 Claims**

1. A compound of the formula



I

wherein R is alkyl of 1–8 carbon atoms, alkenyl, of 2–6 carbon atoms, alkynyl of 2–6 carbon atoms, or (C_{1-8})alkoxy-(C_{1-8})alkyl, or a pharmaceutically acceptable salt thereof.

4,360,522

PURINE DERIVATIVES

Howard J. Schaeffer, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 718,105, Aug. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 662,900, Mar. 1, 1976, Pat. No. 4,199,574, and a continuation-in-part of Ser. No. 608,263, Aug. 27, 1975, abandoned. This application Feb. 1, 1978, Ser. No. 874,067

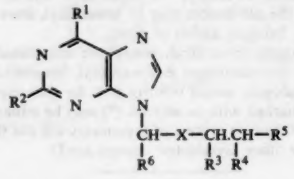
Claims priority, application United Kingdom, Sep. 2, 1974, 38278/74

Int. Cl.³ A61K *31/52*

U.S. Cl. 424—253 **16 Claims**

1. A substituted purine of formula

(I) (I)



wherein X is sulphur or oxygen; R^1 is halogen, hydrogen, thio,alkylthio, alkoxy or azide; R^2 is hydrogen, halogen, amino or azide; R^3 is nitrogen, straight or branched chain or cyclic alkyl, hydroxyalkyl, benzyloxyalkyl or phenyl; R^4 is hydrogen, hydroxy, or lower alkyl; R^5 is hydrogen, hydroxy, amino, alkyl, hydroxyalkyl, benzoyloxy, benzoyloxymethyl, benzyloxy, sulphamoyloxy, phosphate, carboxypropionyloxy, or acetoxy; and R^6 is hydrogen alkyl, hydroxyalkyl or a pharmaceutically acceptable salt thereof.

8. A pharmaceutical composition comprising an effective anti-viral amount of the compound or salt of claim **1** and a pharmaceutically acceptable carrier therefore.

4,360,523

PHARMACEUTICAL FORMULATIONS OF 4'-(9-ACRIDINYLAMINO)-METHANESULFON-M-ANISIDIDE

Murray A. Kaplan, Syracuse, N.Y.; Daniel Bouzard, Francon-ville, France; Claude Perol, Paris, France; Jacques Stemer, Paris, France, and Abraham Weber, Paris, France, assignors to Bristol-Myers Company, New York, N.Y.

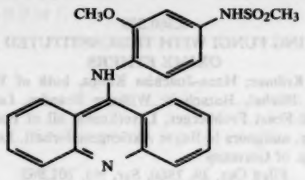
Filed May 16, 1980, Ser. No. 147,056

Int. Cl.³ H61K *31/435*

U.S. Cl. 424—257 **9 Claims**

1. A solid pharmaceutical composition for reconstitution

with water to give a stable aqueous solution of m-AMSA, said composition consisting of m-AMSA having the formula



in admixture with lactic acid, the molar ratio of lactic acid to m-AMSA being from about 1.5:1 to 4:1.

4,360,524

ETHERS OF 6-HALO-4-HALOMETHYLPYRIDINES AND THEIR FUNGICIDAL COMPOSITIONS AND USE

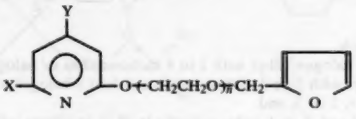
Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 31, 1981, Ser. No. 297,587

Int. Cl.³ A01N *43/40;* **C07D** *213/64*

U.S. Cl. 424—263 **32 Claims**

1. A compound corresponding to the formula:



wherein Y represents trichloromethyl, dichloromethyl or dichlorofluoromethyl; X represents chloro, bromo, or fluoro and n represents an integer of 1 or 2.

4,360,525

DIBENZAZEPINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, AND METHODS OF USE

Werner Müller, Gümlingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

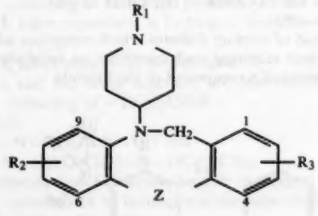
Continuation-in-part of Ser. No. 190,669, Sep. 25, 1980, abandoned. This application Sep. 29, 1981, Ser. No. 306,974

Claims priority, application Switzerland, Oct. 1, 1979, 8836/79; Dec. 20, 1979, 11322/79; Jan. 14, 1980, 268/80

Int. Cl.³ A61K *31/445;* **C07D** *401/04, 413/04, 417/04*

U.S. Cl. 424—267 **36 Claims**

1. A compound of formula I,



I

wherein

R_1 is hydrogen, C_{1-4}-alkyl, C_{2-4}-alkyl substituted by cyano, C_{2-5}-hydroxyalkyl, C_{2-18}-alkanoyloxy-(C_{2-5})-alkyl, C_{7-9}-phenylalkyl, C_{3-6}-cycloalkyl or C_{4-7}-cycloalkylalkyl,

R_2 and R_3 are independently of each other hydrogen, halogen, trifluoromethyl, C_{1-4}-alkyl, C_{1-4}-alkoxy or C_{1-4}-alkylthio, and

Z is —O—, —S— or —NR—, wherein R is hydrogen, C_{1-4}-alkyl, C_{3-5}-alkenyl, C_{7-9}-phenylalkyl, C_{3-6}-cycloalkyl or C_{4-7}-cycloalkylalkyl,

in free base form or in pharmaceutically acceptable acid addition salt form.

4,360,526

AZOLYL-ACETOPHENONE-OXIME ETHERS

Bernd Zeeh, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Ernst Buschmann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

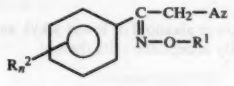
Filed May 15, 1978, Ser. No. 905,761

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2723942

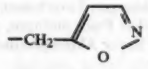
Int. Cl.³ A01N *43/64, 43/74;* **C07D** *249/08, 413/12*

U.S. Cl. 424—269 **10 Claims**

1. An azolyl-acetophenone-oxime ether of the formula

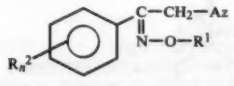


where R^1 is alkyl of 1 to 4 carbon atoms, alkenyl of 3 to 4 carbon atoms, alkynyl of 3 to 4 carbon atoms, phenyl, benzyl, benzyl mono- or polysubstituted in the phenyl ring with F, Cl, Br or CF_3, dr R^1 is the group

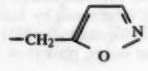


wherein the isoxazole ring can be substituted with methyl, ethyl, or halogen, R^2 is hydrogen or halogen, n is 1, 2 or 3 and Az is 1,2,4-triazolyl, and its salts and metal complexes.

2. A process for combating fungi, wherein the areas in which fungi are to be completed are treated with an effective amount of an azolylacetophenone-oxime ether of the formula



where R^1 is alkyl of 1 to 4 carbon atoms, alkenyl of 3 to 4 carbon atoms, alkynyl of 3 to 4 carbon atoms, phenyl, benzyl, benzyl mono- or polysubstituted in the phenyl ring with F, Cl, Br or CF_3, or R^1 is the group



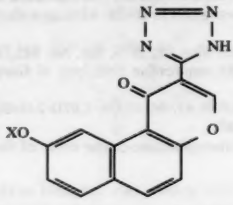
wherein the isoxazole ring can be substituted with methyl, ethyl, or halogen, R^2 is hydrogen or halogen, n is 1, 2 or 3 and Az is 1,2,4-triazolyl, or a salt or metal complex thereof.

4,360,527
9-(HYDROXY, LOWER ALKOXY OR LOWER ALKANOYLOXY)-2-(1H-TETRAZOL-5-YL)NAPHTHO-(2,1-B)-PYRAN-1-ONES AND ANTI-ALLERGIC USE THEREOF

David T. Connor, Ann Arbor, Mich.; Patricia A. Young, Madison, N.J., and Maximilian von Strandtmann, New Castle, Del., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 841,782, Oct. 13, 1977, Pat. No. 4,225,722. This application Apr. 28, 1980, Ser. No. 144,509
Int. Cl.³ A61K *31/41;* C07D *405/02*
U.S. Cl. 424—269 6 Claims

1. A compound of the formula



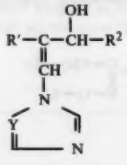
wherein X is hydrogen, lower alkanoyl or lower alkyl, and the non-toxic pharmaceutically acceptable salts thereof.

4,360,528
COMBATING FUNGI WITH 1-AZOLYL-1-PROPEN-3-OLS

Gerhard Jäger; Udo Kraatz, both of Leverkusen; Karl H. Büchel, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paül, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 166,272
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928967
Int. Cl.³ A01N *43/50, 43/64;* C07D *233/60, 249/08*
U.S. Cl. 424—269 10 Claims

1. A 1-azolyl-1-propen-3-ol of the formula



in which

R^1 is phenyl, phenoxy, or phenyl or phenoxy substituted by halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, phenyl or halophenyl,

R^2 is alkyl with 1 to 4 carbon atoms, cycloalkyl with 5 to 7 carbon atoms, phenyl or phenyl substituted by halogen, alkyl with 1 to 4 carbon atoms, halogenalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, phenyl or halophenyl, and

Y is N or CH,

or a physiologically acceptable acid addition salt or metal salt complex thereof.

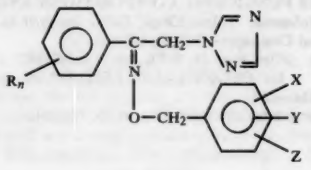
9. A method of combating fungi, comprising applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound, salt or complex according to claim 1.

4,360,529
COMBATING FUNGI WITH TRISUBSTITUTED BENZYL OXIME ETHERS

Wolfgang Krämer; Hans-Joachim Knops, both of Wuppertal; Karl H. Büchel, Burscheid; Wilhelm Brandes, Leichlingen, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 29, 1980, Ser. No. 201,863
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944446
Int. Cl.³ A01N *43/64, 55/02;* C07D *249/08;* C07F *1/08*
U.S. Cl. 424—269 11 Claims

1. A trisubstituted benzyl oxime ether of the formula



in which

R is halogen, alkyl with 1 to 4 carbon atoms or halogenoalkyl with 1 or 2 carbon atoms and 1 to 3 halogen atoms,

n is 1, 2 or 3, and

X, Y and Z each independently is alkyl or alkoxy with 1 to 4 carbon atoms, or halogen, or Y and Z together are methylenedioxy,

or a physiologically acceptable acid-addition salt or metal-salt complex thereof.

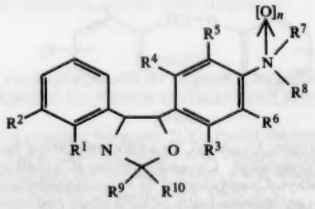
9. A fungicidal composition comprising as active ingredient a fungicidally effective amount of a compound, salt or complex according to claim 1 in admixture with a diluent.

4,360,530
5-[P-(SUBSTITUTED)PHENYL]-2,2-DIALKYL-4-PHENYL-3-OXAZOLINE

Karl Bernauer, Oberwil, and Karlheinz Pfoertner, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 215,965, Dec. 12, 1980, Pat. No. 4,317,914. This application Nov. 12, 1981, Ser. No. 320,262
Claims priority, application Switzerland, Dec. 21, 1979, 11410/79; Oct. 21, 1980, 7856/80
Int. Cl.³ A61K *31/42;* C07D *263/10*
U.S. Cl. 424—272 1 Claim

1. A method of treating diabetes which comprises administering to a host requiring such treatment an antidiabetically effective amount of a compound of the formula



I

wherein R^1 and R^2, independently, are hydrogen, halogen or lower alkyl of 1 to 3 carbon atoms; R^3, R^4, R^5 and R^7, independently, are hydrogen or lower alkyl of 1 to 3 carbon atoms; R^8

is hydrogen, lower alkyl of 1 to 3 carbon atoms or formyl; R^9 and R^{10}, independently, are methyl or trifluoromethyl; and n is 0 or, when both R^7 and R^8 are lower alkyl of 1 to 3 carbon atoms, n is 0 or 1.

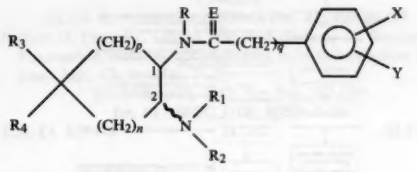
4,360,531

SUBSTITUTED CYCLOALKANES

Moses W. McMillan, Portage, and Jacob Szmuszkovicz, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 9, 1981, Ser. No. 252,535
Int. Cl.³ C07D *487/00;* A61K *31/40*
U.S. Cl. 424—274 **26 Claims**

1. A compound of the formula



I

wherein p and n are each full number integers of from 1 to 3, so that the resulting cycloaliphatic ring has five to seven carbon atoms; the wavy line bond (~) between the nitrogen in the 2-position and the cycloaliphatic ring carbon indicates the bond can be either cis- or trans- with respect to each substituent on the cycloaliphatic ring;

q is 0 or 1;

X and Y are independently selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, nitro, methoxy, hydroxy, azido, C_1 to C_3-alkyl, phenyl, methanesulfonyl, cyano, amino, C_1 to C_3-alkoxycarbonyl, C_1 to C_3-alkanoyloxy, C_1 to C_3-carboxacylamino [(-NHC(O)R_6)];

R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken separately, are hydrogen, C_1 to C_3-alkyl, allyl,

R_1 and R_2, taken together with the nitrogen tc which they are bonded, complete a ring selected from the group consisting of azetidinyl, pyrrolidinyl, and piperidinyl;

R_3, taken separately, is hydrogen, hydroxy,—OR_5 or OC(-=O)R_6;

R_4, taken separately, is hydrogen;

R_3 and R_4, taken together, are selected from the group consisting of —ECH_2CH_2E—;

=E,

[—N~OH], =N~OH and

[-N~OC(O)CH_3]=N~OC(O)CH_3;

wherein each E is bivalent sulfur or oxygen, and R_3 and R_4 cannot both be hydrogen at the same time;

R_5 is C_1 to C_3-alkyl;

R_6 is hydrogen or C_1 to C_2-alkyl;

or an acid addition salt thereof, provided that when R is methyl, R_1 and R_2, taken together with the nitrogen to which they are bonded, form a pyrrolidinyl, X and Y are each chlorine in the 3- and 4-positions of the phenyl ring, p is 1, n is 2, q is 1, E is oxygen, R_4 is hydrogen, then R_3 cannot be acetoxy and a 5-alpha orientation (on the same side of the cycloaliphatic ring as the amide nitrogen).

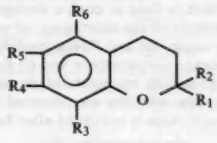
4,360,532

SUBSTITUTED CHROMANS

Joseph E. Sundeen, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 229,415, Jan. 29, 1981, Pat. No. 4,321,270. This application Sep. 24, 1981, Ser. No. 305,304
Int. Cl.³ C07D *311/74;* A61K *31/35*
U.S. Cl. 424—283 **15 Claims**

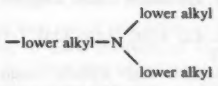
1. A compound of formula



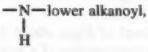
wherein

R_1 is hydrogen, lower alkyl, substituted phenyl wherein the substituent is one or two halogen, lower alkyl or lower alkoxy groups, phenyl, phenyl-lower alkyl, substituted phenyl-lower alkyl wherein the substituent is one or two halogen, lower alkyl or lower alkoxy groups, or lower alkyl-amino-lower alkyl;

R_2 is



R_3, R_4, R_5 and R_6 each is independently selected from hydrogen, hydroxy, amino, lower alkanoyloxy, —O—lower alkyl,



halogen, lower alkyl, or halo substituted lower alkyl; and a physiologically acceptable acid-addition salt or hydrate thereof.

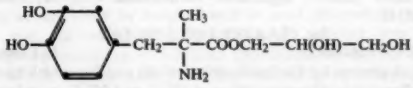
4,360,533

GLYCERYL ESTER OF 1-METHYL-2-(3,4-DIHYDROXYPHENYL)ALANINE

Arthur A. Patchett, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 14, 1981, Ser. No. 330,543
Int. Cl.³ C07C *101/77;* A61K *31/25*
U.S. Cl. 424—309 **6 Claims**

1. A compound of the formula



and pharmaceutically acceptable salts thereof.

6. A method of treating hypertension which comprises administering an effective dose of a compound of claim **1**.

4,360,534

METHOD OF PROVIDING SOFT FLAVOR CHIPS IN AGED COOKIES AND COMPOSITION THEREOF

William J. Brabbs, Springfield, Ohio; Frances H. Savage, Lawrenceburg, Ind., and James P. Smith, College Hill, Ohio, assignors to The Proctor & Gamble Co., Cincinnati, Ohio

Filed Mar. 2, 1981, Ser. No. 238,898

Int. Cl.³ A21D 2/16

U.S. Cl. 426—560 50 Claims

1. A flavor chip-containing cookie dough having improved flavor chip texture after baking, comprising (a) sugar; (b) flour; (c) shortening which is fluid at cookie storage temperatures; (d) 15–60%, by weight of the shortening, of water; (e) flavor chips comprising sugar, fat and flavor ingredients and being solid at cookie storage temperatures; and (f) sufficient emulsifier active at dough mixing temperatures, to render the dough shortening-continuous, whereby migration of the fluid shortening into the flavor chips is enhanced after baking.

4,360,535

ARTIFICIAL CREAM COMPOSITION AND METHOD OF PREPARATION

Donald F. Darling, Eaton Socon, and Eric Dicks, Grays, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 210,070, Nov. 24, 1980, which is a continuation of Ser. No. 13,633, Feb. 21, 1979. This application Dec. 4, 1981, Ser. No. 327,662

Claims priority, application United Kingdom, Feb. 17, 1978, 6399/78

Int. Cl.³ A23C 11/04; A23L 1/19

U.S. Cl. 426—570 8 Claims

1. A whippable oil-in-water artificial cream emulsion composition having improved solubility in hot coffee comprising:

(a) an aqueous dispersion essentially free from protein and cellulose derivatives containing 15% to 25% by weight of a vegetable fat having a slip melting point of 37° to 38° C. and approximately solids content value of N_{20} 80%, N_{30} 22%, selected from palm and lauric fats and their derivatives; and

(b) an effective amount of from about 0.01% to about 0.5% by weight of the composition of a non-alphatending emulsifier composition comprising from about 10% to about 20% by weight of said emulsifier composition of lecithin, the balance a mixture of ionic and nonionic emulsifiers providing an HLB factor of 8 to 12 in the emulsifier composition and consisting essentially of a lactylated alkali metal salt of a fatty acid and a polyoxyalkylene condensate sorbitan ester of a saturated monocarboxylic acid containing from 14 to 18 carbon atoms wherein said polyoxyalkylene condensate contains from about 10 to about 20 alkylene groups each containing up to about 3 carbon atoms.

4,360,536

PROCESS FOR THE DRY FRACTIONATION OF OILS AND FATS HAVING A STEEP DILATATION/TEMPERATURE LINE AND USE OF THE FRACTIONATED FATS IN MARGARINES AND SHORTENINGS

Roelof Keuning; Adolf J. Haighton; Willem Dijkshoorn, all of Vlaardingen, and Hindrik Huizinga, Maassluis, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed May 26, 1981, Ser. No. 266,697

Claims priority, application Netherlands, May 30, 1980, 8003142

Int. Cl.³ A23D 3/02, 5/00, 5/02

U.S. Cl. 426—603 10 Claims

1. A process for the fractionation of oils and fats which have a difference in dilatation values at 15° C. and 25° C. of at least 800 m^3/25 g, comprising:

(i) mixing said oils and fats with triglycerides prior to fractionation; said triglycerides having a higher slip melting point than said oils and fats and said triglycerides having a difference in dilatation values at 15° C. and 25° C. of not more than 600 m^3/25 g;

(ii) subjecting the mixture thus obtained to dry-fractionation for a time and temperature effective to obtain a stearin fraction and an olein fraction.

4,360,537

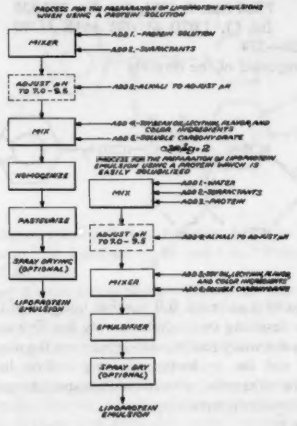
LIPOPROTEIN EMULSIONS FOR FOOD USE AND METHODS FOR PREPARING THE SAME

Chee-Teck Tan, Middletown, N.J.; Gail P. Howard, York, Pa., and Earl W. Turner, Port Chester, N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 682,298, May 3, 1976, abandoned. This application Apr. 5, 1979, Ser. No. 27,417

Int. Cl.³ A23L 1/32

U.S. Cl. 426—656 18 Claims



1. A process for the preparation of low cholesterol lipoprotein emulsions having protein binding and tenderizing properties and moisturizing effect suitable for use in edible food products, comprising the steps of:

dissolving about 2 to 4% disodium phosphate, sorbitan monostearate, polysorbate 60, and sodium stearoyl-2-lactylate in warm water;

dispersing about 30 to 55% of a soluble soy protein isolate in the water with agitation;

adjusting the pH of the dispersion to about 7.0 to 9.5 by the addition of alkali;

heating the pH adjusted protein dispersion to about 135° F. to 200° F. with agitation;

homogenizing the heated dispersion twice through homogenizer with first stage pressure set at about 2500 psi and second stage set at about 500 psi;

adding about 10 to 25% edible soybean oil, about 7 to 12% lecithin, flavor, color, and about 20 to 35% of a soluble carbohydrate ingredient to the protein solution with agitation;

emulsifying the total mixture in homogenizer with first stage set at about 2500 psi and second stage set at about 500 psi; and

cooling the emulsion, such process steps resulting in an emulsion having lipoprotein conjugates that are hydrophilic protein-lipid dipoles which reduce the interfacial tension between the oil and water phase and may be used as an ingredient in edible food products for tenderizing, moisturizing as well as protein binding.

5. A process for the preparation of low cholesterol lipoprotein emulsions having protein binding and tenderizing proper-

ties and moisturizing effect suitable for use in cake and other edible food products, comprising the steps of:

dissolving about 30 to 55% of a soluble soy protein isolate by mixing in water containing about 2 to 4% disodium phosphate, sorbitan monostearate, polysorbate 60 and sodium stearoyl-2-lactylate;

adjusting the pH of the resulting mixture to about 7.0 to 9.5 by the addition of an alkali;

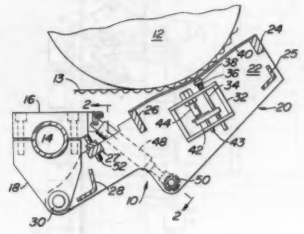
adding about 10 to 25% edible soybean oil, about 7 to 12% lecithin, flavor, color, and about 20 to 35% of a soluble carbohydrate ingredient with thorough mixing;

emulsifying the total mixture in homogenizer with the first stage set at about 2500 psi and second stage set at about 500 psi, such process steps resulting in an emulsion having lipoprotein conjugates that are hydrophilic protein-lipid dipoles which reduce the interfacial tension between the oil and water phase and may be used as an ingredient in edible food products for tenderizing, moisturizing as well as protein binding.

4,360,538
GLUE MACHINE AUTOMATIC RIDER ROLL

Robert H. Craemer, Cherry Hill, and Anthony N. Scardapane, Pennsauken, both of N.J., assignors to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Mar. 19, 1981, Ser. No. 245,299
Int. Cl.³ B05C *1/08;* B05D *1/28*
U.S. Cl. 427—8 **10 Claims**



1. Apparatus for controlling the application of a liquid bonding agent to the flute tips of a web of single face corrugated paperboard at a double facer glue machine which includes a receptacle for holding a supply of the bonding agent, an applicator roll partially immersed in said supply, a rider roll for urging the web against the applicator roll as the web moves therebetween, means supporting the rider roll for movement toward and away from the applicator roll to vary the gap therebetween, and an idler roll upstream from said rider roll for guiding the web, the improvement comprising:

(a) means associated with the idler roll for sensing, generating and transmitting a caliper signal as a function of said caliper of the web,

(b) means associated with the rider roll for sensing, generating and transmitting a gap signal as a function of the gap between the rider roll and the applicator roll,

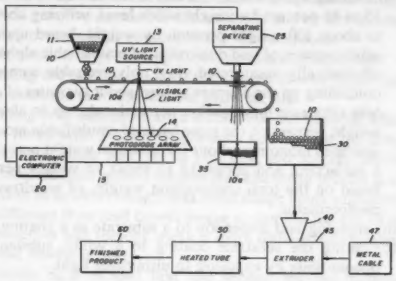
(c) means for modifying one of said caliper signal and gap signal by subtracting a value from the caliper signal or adding a value to the gap signal to represent the desired compression of the web as it passes between said rider roll and said applicator roll,

(d) a comparator for generating a difference signal signal after one of said signals has been modified, a motor responsive to said difference signal, and means controlled by said motor for adjusting said gap.

4,360,539
METHOD FOR INCREASING RESISTANCE TO TREEING IN POLYMERIC INSULATING LAYER

Sandra G. Sachtleben, Jefferson, and John R. Kirkland, Marshall, both of Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 18, 1981, Ser. No. 275,070
Int. Cl.³ B05D *7/20;* G01B *15/00*
U.S. Cl. 427—8 **10 Claims**



1. A method for enhancing the purity of a plurality of discrete pellets comprising an organic polymeric material and an organo silane treeing inhibitor, said method comprising the steps of

(a) exposing at least one of said pellets to ultraviolet radiation, thereby to cause fluorescence in a portion of an exposed pellet comprising an undesired impurity;

(b) detecting fluorescent light from a pellet containing an undesired impurity; and

(c) separating from the remainder of the pellets a pellet including a portion demonstrating fluorescence, thereby to increase resistance to treeing in a polymeric insulating layer manufactured from said remainder of the pellets.

4,360,540
RADIATION CURABLE COMPOSITIONS CONTAINING CYANOALKOXYALKYL AND CYANOTHIAALKYLALKYL ACRYLATES

Joshua A. Chong, Willow Grove, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 30, 1980, Ser. No. 222,783
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—44 **7 Claims**

1. A radiation curable composition comprising

(a) about 5–95% by weight, based on total composition, of at least one cyanoethoxyalkyl acrylate having the formula

$$H_2C{=}CH\text{-}C(O)\text{-}O\text{-}R\text{-}X\text{-}CH(R^1)\text{-}CH(R^2)\text{-}CN$$

wherein R is a (C_2–C_5)alkylene group or a (C_2–C_5)oxaalkylene or thiaalkylene group having discrete alkylene segments containing at least two carbon atoms joined by O or S atom; R^1 and R^2 independently, are a straight-chain or branched-chain (C_2–C_5)alkyl group; and X is O or S;

(b) about 1–90% by weight, based on total composition, of at least one radiation curable component selected from the group consisting of acrylated epoxidized drying-type oils, acrylic oligomers, acrylated bisphenol A/epoxy resins, acrylated urethane prepolymers, and unsaturated polyester resins; and

(c) from 0 up to about 5% by weight, based on total composition, of a photoinitiator.

4,360,541

RADIATION CURED MICROVOID COATINGS

John R. Costanza, North Plainfield, and George Collins, Irvington, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,216
Int. Cl.³ B05D 3/06
U.S. Cl. 427—54.1 4 Claims

1. A process for obtaining a white self-pigmented ultraviolet cured coating composition which comprises:

(a) forming a dispersion of water in monomers at about the 35 to 85 percent by weight solids level, utilizing about 20 to about 100 weight percent, by weight, based upon the solids portion of said dispersion, of emulsifiable alpha beta ethylenically unsaturated vinyl polymerizable compound containing on the average at least about two sites of alpha beta ethylenic unsaturation per molecule; up to about 60 weight percent on the same basis, of emulsifiable monounsaturated monomer; about 1 to about 20 weight percent, of a surfactant; and about 0.5 to about 15 weight percent, based on the total composition weight, of an ultraviolet photoinitiator;

(b) applying said dispersion to a substrate as a coating; and

(c) curing the substrate coating to a white, substantially opaque state by exposure to ultraviolet light.

4,360,542

PROCESS FOR THE PREPARATION OF THIN FILMS OF CADMIUM SULFIDE AND PRECURSOR SOLUTIONS OF CADMIUM AMMONIA THIOCYANATE COMPLEX USEFUL THEREIN

Otto E. Loeffler, Woodbridge, N.J.; Nirmal S. Jain, Irvington, and Otto S. Kauder, New York, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Mar. 31, 1981, Ser. No. 249,530
Int. Cl.³ H01L 31/18; B05D 3/02
U.S. Cl. 427—75 15 Claims

1. A process for the deposition of cadmium sulfide in thin films on a substrate, which comprises applying to the substrate a cadmium ammonia thiocyanate complex in solution in aqueous ammonium hydroxide; heating the complex at a temperature at which the complex undergoes thermal decomposition to form cadmium sulfide; depositing the cadmium sulfide on the substrate; and removing volatile reaction products, water and ammonia.

4,360,543

METHOD OF INSULATING AN ELECTRICAL CONDUCTOR

Harald JanBen, Stemwarde-Siedlung, and Ferdinand Hansch, Wedel, both of Fed. Rep. of Germany, assignors to Dr. Beck & Co. AG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 539,879, Jan. 9, 1975, abandoned. This application Jan. 7, 1980, Ser. No. 109,944
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1974, 2401027
Int. Cl.³ B05D 5/12
U.S. Cl. 427—120 10 Claims

1. A method of insulating an electrical conductor which comprises applying to said conductor a coating of a polyesterimide resin which can be hardened through its free hydroxyl groups and which may also contain amide groups, from a melt of the resin at a temperature above 100° C. using a heatable application means, wherein the resin used is solvent-free, and has been prepared by the esterification or ester-exchange of starting materials for the polyesterimide in the presence of an excess of one or more short-chain diols, and subsequent removal of the diol or diols in such manner that the condensation is only effected to an extent such that the Durrans softening point of the unhardened resin is not greater than 150° C., and that the viscosity of the molten resin at 180° C. is not greater than 5000 mPa s (cP), the equivalent ratio of hydroxyl groups to ester-forming carboxyl groups for the starting materials used to form said resin being in the range of 3:1 to 8:1.

4,360,544

ORGANOTIN SURFACE TREATMENT AND INTERLEAVING MATERIAL FOR GLASS SHEETS

Helmut Franz, Pittsburgh; Paul F. Duffer, Creighton, and Joseph D. Kelly, Cheswick, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 83,084, Oct. 9, 1979, Pat. No. 4,263,371. This application Jan. 28, 1981, Ser. No. 229,046
Int. Cl.³ B05D 5/06, 5/00; C03C 17/42
U.S. Cl. 427—165 9 Claims

1. A method for protecting a glass surface which comprises the steps of:

a. treating the glass surface with an organotin compound at a temperature insufficient to thermally decompose said organotin compound; and

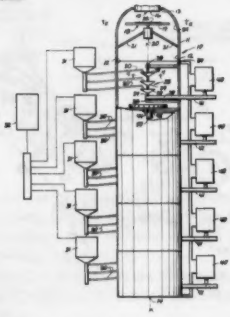
b. applying to the organotin treated glass surface an interleaving material prior to contacting the glass surface in facing relationship with another glass surface.

4,360,545

PARTICLEBOARD FURNISH BLENDER

Thomas M. Maloney, and E. Max Huffaker, both of Pullman, Wash., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Division of Ser. No. 153,274, May 27, 1980, Pat. No. 4,320,715. This application Dec. 17, 1981, Ser. No. 331,627
Int. Cl.³ A01C 1/08
U.S. Cl. 427—212 7 Claims



1. A process for blending a wood particle furnish with a liquid in a hollow housing having continuous cylinderical walls centered along a vertical axis and leading to an open bottom end, including an upper end presenting an annular downwardly flared inner housing surface smoothly merging into the cylinderical walls, comprising the steps of:

feeding the furnish into an opening centered about the vertical axis at the upper end;

forming the furnish within the housing into a continuous free falling cylindrical shell of loose particles centered about said axis by rotating a horizontal disk coaxially mounted about the vertical axis for throwing furnish radially outward toward the annular downwardly flared inner housing surface;

forming a pool of liquid in a plurality of upwardly facing conical disks, centered on said axis within the shell and housing; and

rotating the disk about said axis to produce an atomized spray of the liquid in a circular band directed outward of the conical disks and against the shell; agitating the particles within the shell of loose particles after they drop past one conical disk and before being exposed to the next

conical disk as the particles fall through the housing toward its open bottom end.

4,360,546

ELECTRICAL DISCHARGE LAMP ENVELOPE

Hartmut Schneider, Munich, and Josef Grabmaier, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 117,550, Feb. 1, 1980, Pat. No. 4,345,180. This application Mar. 29, 1982, Ser. No. 363,029

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2906038

Int. Cl.³ B05D *3/02;* **H01J** *7/00*

U.S. Cl. 427—255 **5 Claims**

1. A method of producing a protective layer on a SiO_2-B_2O_3 layer positioned on a silica glass substrate, comprising:

subjecting said SiO_2-B_2O_3 layer to diffusion conditions so that at least some B_2O_3 at an upper region of said layer is diffused out and the resultant region has a lower B_2O_3 content relative to the B_2O_3 content in said layer.

4,360,547

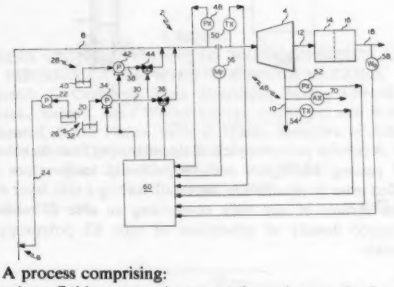
SELECTIVE SCALE FORMATION

Robert G. Asperger, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 14, 1980, Ser. No. 196,962

Int. Cl.³ B05D *1/18;* **H02K** *7/18;* **C02B** *5/06*

U.S. Cl. 427—435 **41 Claims**



1. A process comprising:

treating a fluid stream to be passed through an engine having sweeping elements which limit the thickness of depositions of materials from the stream between the sweeping elements of the engine with at least one scale inducing agent so as to cause deposition of scale between the sweeping elements of the engine.

4,360,548

SELF-CONTAINED COVERT IMAGE

Hugh B. Skees, and Frank V. Parenti, both of Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Oct. 24, 1980, Ser. No. 200,449

Int. Cl.³ B44F *1/10*

U.S. Cl. 428—29 **8 Claims**

1. A material bearing a self-contained covert image, comprising:

a substrate;

a coating of a first ink-like material on said substrate in the configuration of the desired covert image; and

a coating on said substrate of a second ink-like material which is tinted with a color which does not obscure the image obtained after reaction of said first and second ink-like materials, said second ink-like materials being printed in the form of an overt image, said overt image being sufficiently different from said covert image to confuse the eye of the observer and thereby make it more difficult to recognize said covert image;

wherein each of said first and second ink-like materials contain an opposite one of a color-imaging pair of reactants which are colorless or light colored in their unreacted state, but which together produce a colored product when brought into reactive contact, and wherein said overt image coating is at least partially coextensive with said covert image coating and at least one of said first and second ink-like materials are micro-encapsulated to prevent reactive contact of the materials and to permit reactive contact after rupture of the microcapsules.

6. A method of producing a covert image, comprising:

printing the configuration of the desired covert image onto a substrate in a first ink-like material; and

printing onto said substrate a second ink-like material which is tinted with a color which does not obscure the image obtained after reaction of said first and second ink-like materials, said second ink-like material being printed in the form of an overt image, said overt image being sufficiently different from said covert image to confuse the eye of the observer and thereby make it more difficult to recognize said covert image;

wherein each of said first and second ink-like materials contain an opposite one of a color-imaging pair of reactants which are colorless or light colored in their unreacted state, but which together produce a colored product when brought into reactive contact, and wherein said overt image is at least partially coextensive with said covert image and at least one of said first and second ink-like materials are micro-encapsulated to prevent reactive contact of the materials and to permit reactive contact after rupture of the microcapsules.

4,360,549

MOLDING

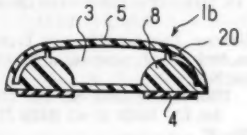
Isao Ozawa, Inazawa; Yutaka Nagai, Aichi, and Yoshihiro Menjo, Chiryu, all of Japan, assignors to Toyoda Gosei Co., Ltd., Japan

Filed Mar. 12, 1981, Ser. No. 242,983

Claims priority, application Japan, Sep. 12, 1979, 54-116965; Apr. 18, 1980, 55-52130

Int. Cl.³ B32B *3/30;* **B60R** *13/04*

U.S. Cl. 428—31 **12 Claims**

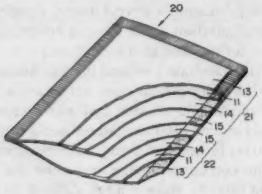


1. Molding composed of a unitary elastomeric molding body comprising a front surface, a bottom, a side portion and a hollow portion, and of an adhesive layer constituted at the bottom, characterized in that the thin molding side portion extends along the front surface, a projection projects on one side or both sides of the bottom, a chamber is constituted between the projection and the molding side portion, and the hollow portion and the chamber are communicated with each other above the projection whereby a fulcrum results at the lower outer edge of the side wall when pressure is applied to said front surface and said projection to produce a bending moment which aides the adhesive force.

4,360,550
COMPOSITE PACKING FILM AND PACKING BAG MADE OF THE SAME

Hiroshi Asakura, Oiso; Ippei Chimura, Yokohama; Teruaki Taguchi, Ebina, and Renzo Minagawa, Koganei, all of Japan, assignors to Toyo Kagaku Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 5, 1980, Ser. No. 184,511
Claims priority, application Japan, Sep. 12, 1979, 54-116059; Oct. 9, 1979, 54-130428
Int. Cl.³ B32B *3/02, 7/00, 27/06, 31/08*
U.S. Cl. 428—35 12 Claims



1. A composite packing film, comprising a base aluminum foil or paper film having longitudinal and transverse elongations of not more than 10%,

a layer of film elongated in one direction and laminated on one face of said base film through an adhesive,

a layer of film elongated at least in a direction substantially perpendicular to the direction of elongation of said first elongated film, said second elongated film laminated to said base film on the side opposite said first elongated film, said first and second elongated films selected from the group consisting of high density polyethylene, polyesters, polypropylene, polyamides, polyvinyl alcohol, and mixtures thereof, and

a layer of sealant having a melting point lower than the melting points of said first and second elongated films, laminated on at least one of said first and second elongated films on the side opposite said base film, said sealant selected from the group consisting of low density polyethylenes, ethylenevinyl acetate copolymers, ionomer resins, and mixtures thereof,

characterized in that the difference between resistance against end tearing of said first elongated film and said second elongated film is at least about 15 kg, and the difference in thickness between the first elongated film and the second elongated film is at least about five microns.

4,360,551
FLEXIBLE FILM LAMINATE ESPECIALLY ADAPTED FOR USE IN THE CONSTRUCTION OF A RETORTABLE FOOD POUCH

John P. Guarino, Lawrenceville, and Frederick C. Schwab, Metuchen, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,178
Int. Cl.³ B65D *65/40*; B32B *27/06*
U.S. Cl. 428—35 28 Claims

1. A flexible film laminate which comprises:

(a) a first layer of heat-sealable polyolefin;

(b) a second layer of previously metallized thermoplastic polyacrylonitrile polymer bonded to said first layer; and,

(c) an adhesive bonding the first layer to the metallized surface of the second layer, said adhesive being a maleic acid anhydride adduct of ethylene-propylene copolymer.

15. A retortable food pouch fabricated from a flexible film laminate which comprises:

(a) a first layer of heat-sealable polyolefin;

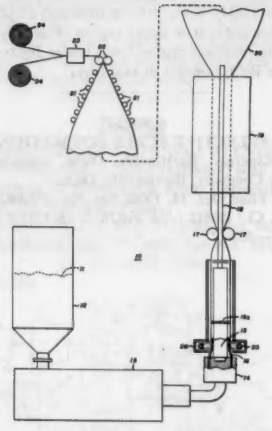
(b) a second layer of previously metallized thermoplastic polyacrylonitrile polymer bonded to said first layer; and,

(c) an adhesive bonding the first layer to the metallized surface of the second layer, said adhesive being a maleic acid anhydride adduct of ethylene-propylene copolymer.

4,360,552
TEXTURED SURFACE POLYPROPYLENE FILM

John W. Eustance, South Glens Falls; Stanley Y. Hobbs, Scotia, and Emilie L. Carley, Hartford, all of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Division of Ser. No. 30,236, May 16, 1979, Pat. No. 4,287,249, which is a continuation-in-part of Ser. No. 686,831, May 17, 1976, abandoned, which is a division of Ser. No. 554,070, Feb. 28, 1975, abandoned. This application Aug. 25, 1980, Ser. No. 180,647
Int. Cl.³ B32B *5/14*
U.S. Cl. 428—36 2 Claims



1. A tubular polypropylene stalk emanating from an extruder and passing through a section primarily temperature controlled prior to insulflation, said stalk having a skin layer at the outer surface of said stalk comprising an area of markedly increased density of spherulites of type III polypropylene crystals.

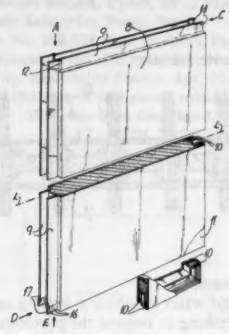
4,360,553
SANDWICH PANEL

Hugo A. J. Landheer, Spijkenisse, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Feb. 17, 1981, Ser. No. 234,914
Claims priority, application Netherlands, Feb. 16, 1980, 8000975
Int. Cl.³ B32B *3/04, 3/06*
U.S. Cl. 428—45 4 Claims

1. A rectangular sandwich panel comprising two skins, an insulating material sandwiched therebetween, two spaced apart arms forming double tongues along each of two adjacent circumferential edges of the panel and cooperable double grooves formed along the other two adjacent circumferential edges, whereby, without additional coupling means, the panel can be assembled on all sides by a double tongue and groove connection with neighboring panels, which are provided, at least at their connecting edges, with cooperable double grooves or tongues to form a continuous wall and wherein at a corner of the panel where double tongues are adapted to meet double tongues of a neighboring panel, the arms of the double tongues are offset so that the spacing between the arms forming the double tongues is increased by at least the thickness of two arms, to accommodate the arms of the double

tongues of the neighboring panel while at an opposite corner of the panel where double tongues are adapted to meet and be



accommodated in double grooves, the arms of the double tongues at the opposite corner are also offset outwardly.

4,360,554

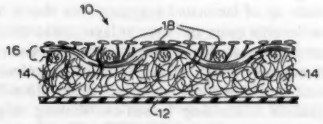
CARPET UNDERLAYMENT OF NEEDLED SCRIM AND FIBROUS LAYER WITH MOISTURE BARRIER

Frederick S. Campbell, West Mansfield, Mass.; Elwood G. Trask, Auburn, Me.; Walter Gasior, Attleboro, and Roland Phaneuf, Barre Plains, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,833

Int. Cl.³ B32B *33/00*

U.S. Cl. 428—91 **6 Claims**



1. A fire retardant, acoustical attenuating, low smoke, article, which comprises:

a scrim of interwoven, high-temperature resistant textile yarns characterized in part by their high tensile strength and low stretch; said scrim having an upper surface and a lower surface;

a layer of fibrous material in the form of discrete staple fibers, attached to the lower surface of the scrim, said layer being consolidated through entanglement of the individual fibers and integrated with said yarns by entanglement of the fibers therewith, said entanglements being of the character produced by a needling operation, said fibers being fibers of a synthetic, high-temperature resistant, polymeric resin;

a layer of said fibers on the upper surface of the scrim, characterized by their adherence to the sub-surface of the underlayment and having been singed; and

a moisture barrier attached to the free surface of the fibrous material layer.

4,360,555

FILL STRAND TRANSFER PROCESS FOR MAKING NON WOVEN FABRICS

Hollis H. Bascom, Livermore; Stephen Matweyou, Oakland; Alan J. Andersen, and John J. Greci, both of Livermore, all of Calif., assignors to Orcon Corporation, Union City, Calif.

Division of Ser. No. 103,621, Dec. 14, 1979, Pat. No. 4,295,905. This application Jun. 19, 1981, Ser. No. 275,212

Int. Cl.³ B32B *5/12*

U.S. Cl. 428—107 **1 Claim**

1. An adhesively bonded non woven fabric laminate comprising

a heavy band of parallel warp strands,

a set of precisely oriented and spaced fill strands disposed on one side only of the band of warp strands,

said fill strands being coated with an adhesive of the kind which softens and flows under pressure and/or heat and from which the solvent has been driven off prior to the application of the fill strands to the warp strands,

said fill strands being bonded to the warp strands by said adhesive on the fill strands by a pressure bonding process effective to force the adhesive from the fill strands to flow into spacings between the warp strands, and

adhesive lines printed across the side of the band of warp strands opposite the side engaged by the fill strands and penetrating the band of warp strands sufficiently far to prevent warp strands from hanging loosely from the side of the fabric opposite the fill strands.

4,360,556

FOAMED LOW DENSITY POLYETHYLENE SHEET MATERIAL AND CARRIER

James E. Heider, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 134,009, Mar. 26, 1980, abandoned. This application Aug. 25, 1981, Ser. No. 295,990

Int. Cl.³ B32B *3/10*

U.S. Cl. 428—131 **2 Claims**

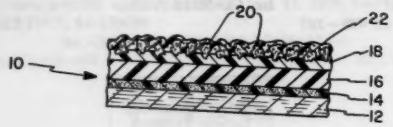
1. A carrier for production application to a plurality of cylindrical containers to support said containers in predetermined spatial relationships with one another, said carrier comprising a resilient, ductile, sheet material having a thickness of from about 0.014 inch to 0.018 inch, and a plurality of aligned openings sized to receive said cylindrical containers in supported relationship with said carrier, characterized in that said sheet material is a foamed low density polyethylene polymer having a density of from about 45 to about 55 pounds per cubic foot and an increased resistance to tearing and to the propagation of tears, by comparison with a sheet of the same polyethylene polymer at the same thickness, but in an unfoamed condition.

4,360,557

PHOSPHORESCENT ABRASIVE COATED PRODUCT FOR SAFETY TREAD

James A. Miller, Stow, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Filed Dec. 3, 1980, Ser. No. 212,639
Int. Cl.³ B32B 5/02
U.S. Cl. 428—142 1 Claim



1. A phosphorescent laminated safety tread, comprising:
a layer of pressure sensitive adhesive, and a white carrier film bonded on its back surface to one surface of said adhesive layer and which is characterized by
said carrier film comprising a two ply layer of high density polyethylene, each ply being oriented in one direction and which directions are not in alignment in said carrier ply;
a layer of light-colored grit bonded to and protruding from a face surface of said carrier film;
a size coat that extends over and covers said grit, which size coat is made from a transparent flexible material, and phosphorescent pigment particles embedded in and distributed throughout said size coat;
where from about 10 percent to about 70 percent dry weight of pigment is present in relation to the solids content of said size coat,
where said grit covers from about 50 percent to 100 percent of the surface of said carrier film, and where said grit is size 80, and
where said pigment is phosphorescent and 99 percent of said pigment particles will pass through a 200 mesh sieve.

4,360,558

OPEN CELL FOAM RESIN SHEET HAVING A RELIEF PATTERN THEREON

Nobuo Miura, Kashiwa, and Yuichi Akiba, Tokyo, both of Japan, assignors to Lonseal Corporation, Tokyo, Japan

Continuation of Ser. No. 81,992, Oct. 4, 1979, Pat. No. 4,281,039. This application Apr. 13, 1981, Ser. No. 253,537
Claims priority, application Japan, Oct. 6, 1978, 53-123757
The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.
Int. Cl.³ B32B 3/12, 3/26
U.S. Cl. 428—159 24 Claims

1. A vinyl chloride resin sheet having a relief pattern thereon, said sheet comprising raised and depressed portions, said raised portions comprising an open cell foam filled with a hardening material, and said depressed portions comprising a depressed open cell foam.

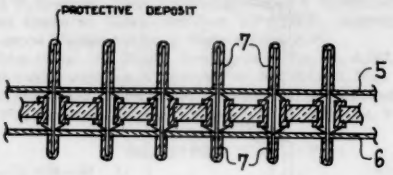
4,360,559

PROCESS FOR VARNISHING A CARD EQUIPPED WITH CONNECTING PINS AND CARD OBTAINED IN THIS WAY

Claude Dalencon, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 31, 1981, Ser. No. 288,774
Claims priority, application France, Aug. 13, 1980, 80 17839
Int. Cl.³ B32B 1/00, 3/00
U.S. Cl. 428—174 8 Claims

1. A process for varnishing a card equipped with connecting pins, wherein it comprises the following stages:
the placing of protective screens on the card substrate so that it is only possible to see those parts of the pins which are external of the card, the screens being perforated at the location of the pins and with the diameter of the latter;
spraying a soapy solution to which a colouring agent has been added on to the pins in the form of a uniform coating, the colouring agent permitting by a visual control to check the uniformity of the deposit;
removal of the screens after drying the protective deposit of the pins;



varnishing the card;
cleaning with hot water to which a wetting agent has been added and brushing to remove the protective deposit for the pins, after drying the varnish.

4,360,560

BASE MATERIAL FOR THE PRODUCTION OF PRINTED CIRCUITS AND PROCESS FOR THE PREPARATION OF THE BASE MATERIAL

Siegfried Kopnick; Dirk Huthwelker; Arnold Franz, all of Troisdorf, and Lothar Jacob, Eckhausen, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,734
Int. Cl.³ B32B 27/04, 27/30, 27/42, 31/12; H05K 1/00
U.S. Cl. 428—236 5 Claims

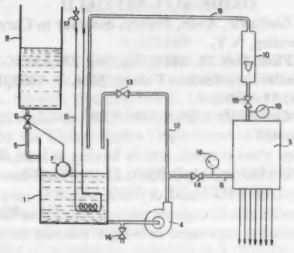
1. A base material for the production of printed circuits according to the additive method which comprises a laminate base made up of laminated-together core sheets impregnated with hardenable resin, and a cover layer made up of a substrate sheet preimpregnated with phenolic resol resin and provided with an adhesive layer of an elastomeric polymer, said preimpregnated substrate sheet being provided with a further resin impregnation containing a self-crosslinking copolymer of acrylic monomers and up to 30% by weight of a hardenable phenolic resol resin.

4. A process for the preparation of a base material for forming printed circuits which comprises impregnating a plurality of core sheets with a hardenable resin solution, drying the resin impregnated core sheets at temperatures of 100°–140° C. to effect prepolymerization of the resin, then preimpregnating a substrate sheet constituting a cover layer with a phenolic resol resin, coating this cover layer with a rubber adhesive and then drying the cover layer, pressing the thus-layered sheets, with the use of pressure and at temperatures of 130°–170° C., together to bond the sheets under hardening of the resin and of the adhesive, the preimpregnated, predried substrate sheet serving as the cover layer being impregnated with a further hardenable resin material containing a self-crosslinking copolymer on the basis of acrylic derivatives and up to 30 parts by weight of a hardenable phenolic resol resin, and being dried at a temperature of between 110° and 180° C., whereafter the adhesive is applied preferably in a layer thickness of 30–50μ and dried at temperatures of 130°–150° C.

4,360,561
BINDER FOR MANUFACTURING NONWOVENS

Jean-Claude Daniel, Fontenay sous Bois; Jacques Grossoleil, Paris, and Robert Roullet, Lyons, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Division of Ser. No. 898,954, Apr. 21, 1978, Pat. No. 4,271,055.
This application Jul. 30, 1980, Ser. No. 173,644
Claims priority, application France, Apr. 22, 1977, 77 12161
The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.
Int. Cl.³ B32B *27/06*
U.S. Cl. 428—288 6 Claims



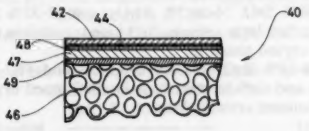
1. Process for the manufacture of nonwoven fabrics comprising the steps of forming a nonwoven web of fibers, wetting the web with an aqueous latex base binder of a synthetic polymer selected from the group consisting of styrene-butadiene copolymers, carboxylated styrene-butadiene copolymers, alkyl acrylate-vinyl chloride copolymers, carboxylated alkyl acrylate-vinyl chloride copolymers, vinylidene chloride-vinyl chloride copolymers, carboxylated vinylidene chloride-vinyl chloride copolymers, alkyl polyacrylates and carboxylated alkyl polyacrylates, in which the hydrosoluble compounds in solution in the aqueous phase of the latex is less than 0.5% by weight in relation to the polymer, compressing the web wetted with the binder composition to ensure penetration into the web and then drying the web to form the nonwoven fabric.

4. Nonwoven fabrics manufactured by the process of claim 1.

4,360,562
LAMINATED ELECTRIC ELEMENTS

Yasushi Endo, and Seiichi Suzuki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1981, Ser. No. 266,092
Claims priority, application Japan, Feb. 24, 1980, 55-71822[U]
Int. Cl.³ B32B *7/00, 7/12*
U.S. Cl. 428—317.7 26 Claims



1. In a laminated electric element comprising a plastic film of a dielectric material provided on at least one side thereof with a conductive layer and a foam layer, the improvement in which a middle layer is disposed between the plastic film and the foam layer and is fixed to each by means of an adhesive to thereby provide a flat surface on the plastic film.

4. The laminated electric element according to any one of claims 1 to 3, wherein said adhesive affixing the middle layer to the plastic film and the foam layer is in the form of layers.

17. The laminated electric element according to claim 4, wherein the adhesive layer is composed of a vinyl acetate resin type adhesive, an epoxy resin type adhesive, an acrylic resin type adhesive or a urethane type resin.

4,360,563
COMPOSITE MATERIAL SURFACE FOR HANDLING HOT GLASS

Edward J. Stengle, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

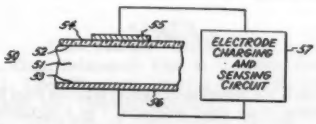
Division of Ser. No. 41,213, May 21, 1979, Pat. No. 4,271,212.
This application Oct. 20, 1980, Ser. No. 198,373
The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—323 6 Claims

1. As a product by process, a composite material for handling glass charges, newly-formed hot glass articles and the like and comprising a coated metallic substrate formed by applying a primer coating of monomeric/polymeric first silicone resin to said substrate and air-drying the same, applying a coating of solventless curable thermosetting second silicone resin binder over said primer coating, depositing at least one layer of granular heat-resistant solid lubricant carbonaceous material over said binder coating and allowing said binder to wet and embed said granular carbonaceous material to firmly retain the same, and heat-curing said binder into thermoset further-hardened condition to permanently affix said granular carbonaceous material to said substrate.

4,360,564
THIN FILMS OF LOW RESISTANCE AND HIGH COEFFICIENTS OF TRANSMISSION IN THE VISIBLE SPECTRUM

Herbert R. Philipp, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,352
Int. Cl.³ B32B *15/04;* H01J *40/14*
U.S. Cl. 428—336 2 Claims



1. A radiation sensing device comprising

a substrate of semiconductor material of one conductivity type,

a first layer of transparent insulating material overlying a major surface of said substrate, a film of a conductive material overlying said first layer and forming a capacitor with said first layer, said film consisting of an intermetallic compound having the formula $AuAl_2$, said film being less than about 300 Angstroms thick,

means for making conductive contact to said film,

means for making conductive contact to said substrate.

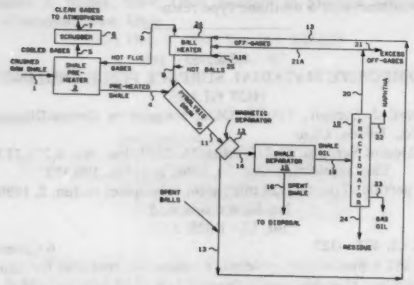
4,360,565
IRON-CONTAINING REFRACTORY BALLS FOR RETORTING OIL SHALE

Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 837,130, Sep. 28, 1977, Pat. No. 4,160,719.
This application Feb. 6, 1979, Ser. No. 9,627
Int. Cl.³ B32B *15/02*
U.S. Cl. 428—404 5 Claims

1. Iron-containing ceramic balls having a diameter of about ¼" to 2" and containing about 10 to 90 weight percent iron, said ceramic content of said balls being a high temperature fired

high-refractory alumina, wherein said iron-containing ceramic balls are characterized in cross-section by an alumina ceramic



core, shell of iron particles around said core, and an outer coating of alumina ceramic.

4,360,566
CURABLE ORGANOPOLYSILOXANE COMPOSITION FOR HEAT FIXING ROLLS

Koji Shimizu; Toshio Watanabe, both of Ichihara, and Mitsuo Hamada, Kisaratsu, all of Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,857
Claims priority, application Japan, Mar. 5, 1981, 56-31778
Int. Cl.³ B32B *15/08*; B21B *31/08*; B32B *5/16*
U.S. Cl. 428—404 **2 Claims**

1. A heat fixing roll for pressure fusing electrophotographic dry toner powder comprising a core roll substrate with an outer layer of silicone rubber, optionally having a primary layer adhering the silicone rubber to the core roll substrate, wherein the improvement comprising the outer layer of silicone rubber which is a silicone rubber containing substantial amounts of siliceous filler, said silicone rubber being the cured product of a composition consisting essentially of

(A) 100 parts by weight of a polyorganosiloxane expressed by the average unit formula

$$R_aR'_bSiO_{\frac{4-a-b}{2}}$$

wherein R is a monovalent radical selected from the group consisting of an alkyl radical of 1 to 8 inclusive carbon atoms, phenyl radical, and 3,3,3-trifluoropropyl radical, R′ is an aliphatically unsaturated hydrocarbon radical selected from the group consisting of vinyl radical and allyl radical, a has a value of 1.90 to 2.05, b has a value of 0.0005 to 0.1, and the sum of a+b has a value of 1.91 to 2.06, and the polyorganosiloxane having a viscosity at 25° C. in the range of from 0.1 to 100 Pa-s,

(B) an amount of a polyorganohydrogensiloxane sufficient to provide 0.5 to 10 silicon-bonded hydrogen atoms per aliphatically unsaturated hydrocarbon radical in (A), the polyorganohydrogensiloxane being expressed by the average unit formula

$$R_cH_dSiO_{\frac{4-c-d}{2}}$$

wherein R is as defined above, c has a value of 1.0 to 2.1, d has a value of 0.001 to 1.0, and the sum of c+d has a value of 1.001 to 3, and the polyorganohydrogensiloxane having a viscosity at 25° C. in the range of 0.001 to 5 Pa-s,

(C) 50 to 250 parts by weight of a siliceous filler of which at least 10 parts by weight is a reinforcing silica filler, said siliceous filler being surface treated,

(D) 0 to 100 parts by weight of a triorganosiloxy endblocked polydiorganosiloxane in which the organic radicals are the same as defined for R and the polydiorganosiloxane has a viscosity at 25° C. in the range of from 0.01 to 5 Pa-s,

(E) an amount of a platinum group catalyst sufficient to provide from 1 to 800 parts by weight platinum group metal per one million parts by weight of the total weight of (A), (B), (C), and (D), and

(F) optionally a platinum group catalyst retardant, where the composition has a viscosity at 25° C. in the range of 2 to 10,000 Pa-s.

4,360,567
EASY-TO-CLEAN GLASS OR GLASS-CERAMIC COOKWARE IN THE ALKALINE EARTH METAL OXIDE-Al_2O_3-SiO FIELD

Gildas J. M. Guillevic, Avon, France, assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 25, 1981, Ser. No. 237,850
Claims priority, application France, Mar. 7, 1980, 80 05188; Jan. 30, 1981, 81 01801
Int. Cl.³ B32B *9/00, 17/06*; C03C *3/10, 3/22*
U.S. Cl. 428—410 **2 Claims**

1. A glass or glass-ceramic article having at least an integral surface layer containing MgO-based and/or CaO-based and/or SrO-based and/or BaO-based crystals which is easy to clean after partial pyrolysis of organic materials on its surface which consists essentially, expressed in weight percent on the oxide basis, of:

(a) 14.8–19.6% MgO, 16.2–20.0% Al_2O_3, and 58.7–66.5% SiO_2, when said surface layer contains MgO-based crystals as the predominant crystal phase; or

(b) 22.2–31.6% CaO, 42.8–53.9% Al_2O_3, and 23.8–33.6% SiO_2, when said surface layer contains CaO-based crystals as the predominant crystal phase; or

(c) 31–48% SrO, 24–35.7% Al_2O_3, and 28–35% SiO_2, when said surface layer contains SrO-based crystals as the predominant crystal phase; or

(d) 42.4–45% BaO, 10–15.9% Al_2O_3, and 41.7–45% SiO_2, when said surface layer contains BaO-based crystals as the predominant crystal phase.

2. A glass-ceramic article having an interior portion containing β-quartz solid solution and/or β-spodumene solid solution as the predominant crystal phase, said interior portion being essentially free from MgO and/or CaO and/or SrO and/or BaO, and an integral surface layer containing MgO-based and/or CaO-based and/or SrO-based and/or BaO-based crystals as the predominant crystal phase which is easy to clean after partial pyrolysis of organic materials on its surface, said surface layer consisting essentially, expressed in weight percent on the oxide basis, of:

(a) 14.8–19.6% MgO, 16.2–20.0% Al_2O_3, and 58.7–66.5% SiO_2, when said surface layer contains MgO-based crystals as the predominant crystal phase; or

(b) 22.2–31.6% CaO, 42.8–53.9% Al_2O_3, and 23.8–33.6% SiO_2, when said surface layer contains CaO-based crystals as the predominant crystal phase; or

(c) 31–48% SrO, 24–35.7% Al_2O_3, and 28–35% SiO_2, when said surface layer contains SrO-based crystals as the predominant crystal phase; or

(d) 42.4–45% BaO, 10–15.9% Al_2O_3, and 41.7–45% SiO_2, when said surface layer contains BaO-based crystals as the predominant crystal phase.

4,360,568
HOT MELT ADHESIVE AND ADDITIVE THEREFOR

George M. Allison, III, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 148,878, May 12, 1980, Pat. No. 4,314,926.
This application Jul. 21, 1981, Ser. No. 285,642
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—411 **9 Claims**

1. Laminate structure comprising at least three elements namely

(a) a first solid element,
(b) a second solid element,
(c) an adhesive layer between said first and said second solid element comprising
(aa) conjugated diene/monovinyl aromatic copolymer component comprising at least one of
(aaa) non-hydrogenated conjugated diene/monovinyl aromatic copolymers,
(bbb) hydrogenated conjugated diene/monovinyl aromatic copolymers with extender oil,
(bb) a modifying agent compatible with the conjugated diene section of the copolymer,
(cc) poly(alpha-methylstyrene)
(dd) polyphenylene oxide.

4,360,569

POROUS METAL HYDRIDE COMPOSITE AND PREPARATION AND USES THEREOF

William A. Steyert, and Clayton E. Olsen, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 12, 1980, Ser. No. 129,535
Int. Cl.³ B22F 3/10; C01B 6/00
U.S. Cl. 428—566 19 Claims

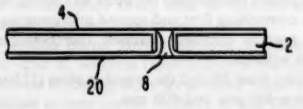
1. A composite comprising:
a plurality of aggregates arranged in a random array so that interconnected large pores having an average largest linear dimension C exist between individual aggregates, each of said aggregates comprising:
(a) first powder particles comprising particles of an interstitial metal hydride and having an average largest linear dimension a after initial activation by hydriding, and
(b) second powder particles comprising lead powder,
wherein said first powder particles are separated from each other by said lead powder,
wherein said first powder particles are substantially inert to said lead powder,
wherein said lead powder forms permeable cages around said first powder particles, a plurality of said cages forming one of said aggregates,
wherein C is at least about 100 μm, and wherein C is much greater than a.

4,360,570

USE OF PHOTOSENSITIVE STRATUM TO CREATE THROUGH-HOLE CONNECTIONS IN CIRCUIT BOARDS

Sam Andreades, Red Bank; Grant A. Beske, Princeton Junction, and John W. Lott, Tinton Falls, all of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 132,154, Mar. 20, 1980, Pat. No. 4,283,243, which is a continuation of Ser. No. 954,085, Oct. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 878,878, Feb. 17, 1978, abandoned. This application Jun. 15, 1981, Ser. No. 273,944
Claims priority, application European Pat. Off., Feb. 14, 1979, 79100439
The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.
Int. Cl.³ B32B 3/24
U.S. Cl. 428—596 11 Claims



1. An element suitable for fabricating printed circuit boards comprising
(a) a substrate board having through-holes;
(b) a conductive layer on the surface of the board and the through-holes comprising:
a layer of polymerized insulating adhesive material having imbedded therein,
a discontinuous layer of conductive particles rendered conductive with,
a layer of electroless-plated metal interconnecting the particles; and
a layer of metal electroplated over the electroless-plated metal layer.

4,360,571

X-RAY INTENSIFYING SCREEN

Jacob G. Rabatin, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 826,405, Aug. 22, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,463
Int. Cl.³ C09K 11/475; G01T 1/00
U.S. Cl. 428—691 2 Claims

1. An improved x-ray screen including a backing member coated with a physical admixture of a rare earth oxyhalide phosphor according to the formula:
$LnOX:T_x$
wherein
Ln is La and/or Gd,
X is Cl and/or Br, and
T_x is Tb^{3+} and/or Tm^{3+} ion present at activator levels,
with a fatty acid additive containing from about 8 to about 20 carbon atoms in sufficient quantity from a small but effective amount up to about 5 weight percent based on the phosphor weight to retain original emission brightness when utilized in said x-ray screen for a longer time period than for said phosphor without said additive, and with said phosphor admixture being adhesively bonded with a polymer binder to said backing member, and said improved x-ray screen resisting loss in film speed and brightness when associated with a photographic film.

4,360,572

ELECTROCHEMICAL CELL

David L. Chua, Bridgeport; Kurt F. Garoutte, Furlong, and Louis L. Levy, Plymouth Meeting, all of Pa., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Feb. 18, 1981, Ser. No. 235,463
Int. Cl.³ H01M 10/52
U.S. Cl. 429—53 14 Claims

1. An electrochemical cell having lithium anode, a thionyl chloride depolarizer and a sulphur dioxide passivation control agent and wherein said cell has been pressure relieved to substantially reduce the internal cell pressure.

4,360,573

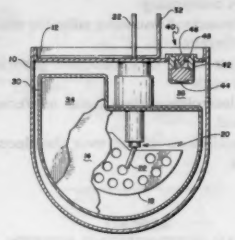
ELECTROCHEMICAL CELL CONSTRUCTION

T. V. Rao, Coon Rapids, and Thomas M. Nutzman, Andover, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 18, 1981, Ser. No. 264,791
Int. Cl.³ H01M 2/36
U.S. Cl. 429—72 8 Claims

1. In an electrochemical cell of the type having a metal container for housing cell components, and an opening in the container for introducing a component into the container, the improvement comprising penetrable, self-sealing septum means closing the opening whereby a fluid component may be introduced into the container through the septum means by means of a hypodermic-like needle and wherein the septum means includes a metal sleeve carried in the opening, the sleeve

defining a filler opening into the container having inner and outer closure areas, the self-sealing septum closing the inner



closure area, the sleeve further including a metal plug closing the outer closure area.

4,360,574

HIGH-TEMPERATURE STORAGE BATTERY

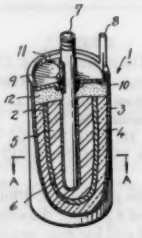
Young W. Park, Seoul, Rep. of Korea, assignor to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Apr. 27, 1981, Ser. No. 258,037

Claims priority, application Rep. of Korea, May 22, 1980, 1990/80[U]

Int. Cl.³ H01M *4/00*

U.S. Cl. 429—94 5 Claims



1. In a high-temperature cell employing an alkali or alkali earth metal or its alloy as a negative electrode, a metal oxide or sulfide as a positive electrode and a molten salt containing said alkali or alkali earth metal ions an an electrolyte, the improvement wherein the cell structure comprises:

a cylindrical cell housing;

a cylindrical electrode of a first polarity located within said cell housing, said electrode including a current collector;

a tubular electrode of a second polarity disposed around said cylindrical electrode at the inside of said cell housing;

a cylindrical separator positioned between said electrodes;

a cell lid covering the top of said cell housing, said lid being provided with a feedthrough sleeve; and

a first solid electrode terminal filling the interior of and circumferentially contacting said cylindrical electrode and extending outwardly of said cell housing through said feedthrough sleeve.

4,360,575

ANNULAR CATHODE ELECTRODE STRUCTURES FOR SODIUM SULPHUR CELLS

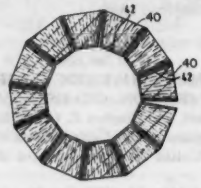
Michael P. J. Brennan, Warrington, England, assignor to Chloride Silent Power Limited, London, England

Division of Ser. No. 41,380, May 23, 1979, Pat. No. 4,294,005, which is a continuation-in-part of Ser. No. 861,924, Dec. 19, 1977, Pat. No. 4,176,447. This application Mar. 20, 1981, Ser. No. 245,784

Claims priority, application United Kingdom, Dec. 20, 1976, 53197/76

Int. Cl.³ H01M *4/80*

U.S. Cl. 429—104 8 Claims



1. An annular cathode electrode structure for a sodium sulphur cell, said structure having a porous matrix of electronically-conductive fibrous material with the fibres lying in generally radial directions, the matrix being impregnated with an electro-chemical reactant material which is solid at room temperature, said structure comprising a plurality of segments, each an elongate member of trapezoidal form in cross-section, with each segment comprising a plurality of stacked strips each cut from a sheet with the surfaces of the strip formed from the major surfaces of the sheet lying in substantially radial planes with respect to the axis of the annular structure and the cut surfaces defining portions of the inner and outer cylindrical surfaces of the annular structure.

4,360,576

LEAD ACCUMULATOR

Claude Pascon, Le Plessis-Robinson, and Georges Marcellin, Vigneuse sur Seine, both of France, assignors to Societe Anonyme dite: Compagnie Generale d'Electricite, Paris, France

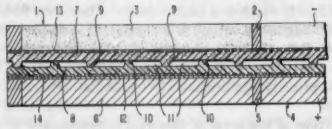
PCT No. PCT/FR80/00104, § 371 Date Mar. 4, 1981, § 102(e) Date Jan. 15, 1981, PCT Pub. No. WO81/00176, PCT Pub. Date Jan. 22, 1981

PCT Filed Jun. 30, 1980, Ser. No. 230,960

Claims priority, application France, Jul. 4, 1979, 79 17384

Int. Cl.³ H01M *2/18*

U.S. Cl. 429—143 12 Claims



1. In a lead accumulator comprising a plurality of elements, each element consisting of a negative plate, a positive plate and separating means intercalated between said plates, said separating means comprising first and second microporous separators including spacers defining channels therebetween, the improvement wherein:

the positive plate (4) and the negative plate (1) have a height between 100 mm and 600 mm,

each microporous separator has a thickness of approximately 1.5 mm,

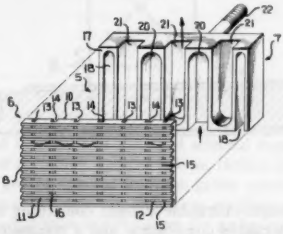
the thickness of the channels (11) is between 0.5 mm and 2

mm and wherein the width of the channels (11) is between 2 mm and 10 mm.

4,360,577
RIB-GRID CATHODE

Ronald I. Klootwyk, San Jose, Calif., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Oct. 30, 1978, Ser. No. 955,566
Int. Cl.³ H01M 4/02
U.S. Cl. 429—209 10 Claims



1. A cathode face plate for a power module of the type including a consumable anode, said cathode face plate including a face surface and a rear surface, said face surface substantially in its entirety defining a plurality of adjacent parallel continuous anode contacting ribs having parallel electrolyte circulating path defining grooves therebetween, a plurality of separate parallel inlet and discharge passage means arranged in alternating relation in said rear surface transversely of said grooves for respectively supplying and discharging an electrolyte, the combined depths of said grooves and said passage means being greater than the thickness of said face plate with said passage means intersecting said grooves in flow controlling slots.

4,360,578
METHOD OF ENHANCING THE WETTABILITY OF BORON NITRIDE FOR USE AS AN ELECTROCHEMICAL CELL SEPARATOR

Lowell R. McCoy, Woodland Hills, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jan. 23, 1981, Ser. No. 228,002
Int. Cl.³ H01M 6/20, 2/16
U.S. Cl. 429—247 5 Claims

1. A method of treating a felt layer of fiberous boron nitride for use as an interelectrode separator in a secondary electrochemical cell to enhance its wettability by molten electrolytic salt comprising:

wetting the boron nitride fibers with an aqueous solution of magnesium acetate and a surfactant;

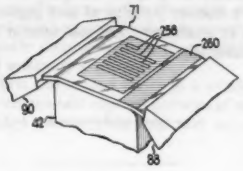
drying the wetted boron nitride fibers at a temperature of about 150°–250° C. wherein rapid boiling of the solution and void formation in the felt layer are avoided to leave a deposit of magnesium acetate on the surfaces of said fibers; and

heating the boron nitride to a sufficient temperature to decompose the magnesium acetate and form an adherent coating of magnesium oxide on the surfaces of the boron nitride fibers.

4,360,579
APPARATUS FOR PREVENTING FOGGING OF INTERMEDIATE FILM IN MICROFICHE RECORDING SYSTEMS

Peter Klose, Troy, and Herbert Ovshinsky, Oak Park, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Nov. 17, 1980, Ser. No. 207,229
Int. Cl.³ G03C 1/76, 3/02
U.S. Cl. 430—8 16 Claims



1. A method for preventing light fogging of unexposed portions of an initially transparent film strip producing opaque imaged areas when imaged by imaging energy and contained within an imaging energy sealed portion of film support means from which a limited area of the film strip to be imaged is exposed to an external imaging energy region, comprising forming integral with the film strip in or on the film strip at least one propagation barrier region between each such limited area of the film strip to be imaged and the adjacent later to be exposed areas, each such barrier region having the property of inhibiting the propagation of said imaging energy into adjacent later to be exposed areas of said film strip by internal reflection of such energy between the opposite surfaces of the film.

12. An improved photographic film strip for use in a microfiche recording system, said film strip comprising:

a film strip body having a photoactive layer, said film strip being exposable to a light image to form an image on a portion thereof, which image on said exposed portion of said film strip is transferable to microfiche film card by subjecting said exposed portion to radiant energy; and

a plurality of propagation barrier means integral with said film body on or in said film body, said barrier means being separated from each other along a portion of the length of said film strip body and disposed intermediate to longitudinally spaced imaging areas on said film strip body, each of said barrier means being disposed in a transverse direction extending across said film strip body to intercept light propagation by internal reflection through said film body towards unimaged areas of said film strip caused by said radiant energy transferring said image to said microfiche film card to inhibit fogging of said unimaged areas.

4,360,580
LIQUID DEVELOPER FOR USE IN ELECTROSTATIC PHOTOGRAPHY

Kazuo Tsubuko; Kenichi Matsubayashi, and Tsuneo Kurotori, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 851,986, Nov. 16, 1977, abandoned. This application May 20, 1980, Ser. No. 152,060
Claims priority, application Japan, Dec. 2, 1976, 51-144927
Int. Cl.³ G03G 9/12
U.S. Cl. 430—137 26 Claims

1. A liquid developer comprising: a carrier liquid having a high electric resistivity and a low dielectric constant; coloring agent particles dispersed in said carrier liquid, said coloring agent particles consisting essentially of organic pigment particles substantially completely coated with a dry coating of first resin which is substantially insoluble in said carrier liquid, said coloring agent particles having an average particle diameter in the range of from 0.01 to 20 microns and having an electric

resistivity of about 10^8 to 10^{14} Ωcm; a resin dispersion composition dispersed in said carrier liquid, said resin dispersion composition having been prepared by mixing (a) a solution of second resin dissolved in first monomer, with (b) a non-aqueous organic liquid having a high electric resistivity and a low dielectric constant, said second resin being substantially insoluble in said non-aqueous organic liquid, said first monomer being capable of forming a first polymer which is solvated by said non-aqueous organic liquid, and then subjecting the mixture of (a) and (b) to polymerizing conditions to polymerize said first monomer to form said resin dispersion containing said first polymer, said first polymer being adsorbed to said pigment to maintain a distinct polarity of said pigment and to make same fixable to a substrate, and said second resin acting as a dispersion stabilizer.

4,360,581

COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING NON-DIFFUSING ELECTRON DONOR COMPOUNDS

Heinrich Odenwälder, Leverkusen; Hans Vetter, Cologne, both of Fed. Rep. of Germany; Wilhelmus Janssens, Aarschot, and Jan Jaeken, Hove, both of Belgium, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,187

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947425

Int. Cl.³ G03C *5/54, 1/40*

U.S. Cl. 430—218 **3 Claims**

1. In a color photographic recording material comprising at least one light-sensitive silver halide emulsion layer unit and, associated with this unit, a combination of a non-diffusing, reducible color providing compound which, in the reduced state, is capable of releasing a diffusible dye under alkaline development conditions, and an electron donor compound (ED compound) which is capable of reducing the non-diffusing, reducible color providing compound under the alkaline development conditions, the improvement according to which the material contains, as ED compound, a compound corresponding to the following general formula:

$$R^1(-L^1=L^2)_n-NH-SO_2-X$$

in which

L^1, L^2 each represent a methine group

$$(-\overset{|}{C}=, =\overset{|}{C}-)$$

which may be a member of an at least partially unsaturated carbocyclic or heterocyclic ring system,

R^1 represents $-OR^2$, $-SR^2$ or $-NHR^3$,

R^2 represents hydrogen or a group which is capable of being hydrolysed under the conditions of photographic development,

R^3 represents hydrogen, alkyl, aryl, acyl or a group which together with the nitrogen atom defined in R^1 and with L^1, optionally with the inclusion of L^2, completes a ring system having at least one 5-, 6- or 7-membered heterocyclic ring,

n represents 1 or 2, and

X represents any colorless organic group,

at least R^1, L^1, L^2 or a ring completed by the said groups (R^1, L^1, L^2) or X contains a group which confers diffusion resistance.

4,360,582

PHOTOPOLYMERIZABLE ELEMENT COMPRISING A SOLUBLE OR DISPERSIBLE ORIENTED FILM SUPPORT

Tadashi Taguchi, Kawasaki; Noboru Fujikawa, Fuji; Mitsuo Kohno, Yokohama; Katsumi Yoshitake, Yokosuka, and Kunio Satake, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

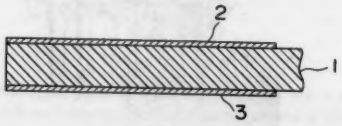
Continuation-in-part of Ser. No. 104,944, Dec. 18, 1979, Pat. No. 4,301,230, which is a division of Ser. No. 923,763, Jul. 11, 1978, Pat. No. 4,211,560. This application Aug. 25, 1981, Ser. No. 295,960

Claims priority, application Japan, Jul. 12, 1977, 52-82573; Dec. 26, 1977, 52-157091

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ G03C *1/90, 5/00, 1/78, 1/96*

U.S. Cl. 430—260 **18 Claims**



1. A photopolymerizable element comprising a layer of a photopolymerizable composition and a transparent oriented film support laminated onto one surface of the photopolymerizable composition layer which support is soluble or dispersible in a liquid developer for the photopolymerizable composition layer and capable of transmitting actinic rays and which support is of a member selected from the group consisting of methyl methacrylate homopolymer and copolymers, vinyl chloride homopolymer and copolymers, polyvinyl alcohol, and mixtures thereof.

4,360,583

HIGH RESOLUTION VIDEO STORAGE DISK

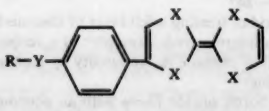
Edward M. Engler, Wappingers Falls; Frank B. Kaufman, Ossining; Steven R. Kramer, Katonah, and Bruce A. Scott, Pleasantville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,341

Int. Cl.³ G03C *1/00*

U.S. Cl. 430—270 **8 Claims**

1. A high resolution video storage disk comprising a substrate having disposed thereon a monofunctionally substituted tetraheterofulvanene and a halocarbon having a high electron affinity for photo-reaction with said monofunctionality substituted tetraheterofulvalene, wherein said monofunctionally substituted tetraheterofulvalene having the molecular structure of:



wherein

X is selected from the group consisting of S and Se;

R is selected from the group consisting an alkyl group having from about 1 to about 8 carbon atoms, benzyl, and a benzyl group which is part of a polymer chain; and

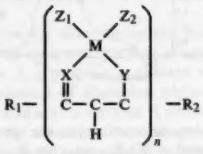
Y is selected from the group consisting of an ester or ether group.

4,360,584
METHOD OF PHOTOPOLYMERIZATION WITH COMPLEX METAL CHELATE CATALYSTS

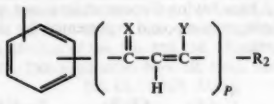
James M. Halm, Lombard, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed Mar. 18, 1981, Ser. No. 245,158
Int. Cl.³ G03C 1/68, 1/66
U.S. Cl. 430—286 13 Claims

1. In the photopolymerization of unsaturated monomers to form the corresponding polymers and copolymers the improvement wherein the polymerization is carried out upon exposure to light in the presence of Group IIIA catalyst in the form of a complex metal chelate having the structural formula



in which M is a metal or metalloid selected from the group consisting of aluminum, gallium, indium, thalium and boron, X and Y are groups selected from the group consisting of sulphur, nitrogen, phosphorus, antimony, selenium and oxygen, Z_1 and Z_2 are groups selected from the group consisting of a halogen and substituted and unsubstituted alkyl, aryl, alkaryl, alkoxy, aryloxy, alkaryloxy and heterocyclic groups selected from the groups consisting of furyl, pyrryl, iodyl, pyrimidyl, pyridyl and furfuryl, R_1 and R_2 are groups selected from the group consisting of substituted and unsubstituted aryl, alkaryl, alkyl and alicyclic groups, n is a number of 1 to 3, and when n is 1, R_1 may be a group having the general formula

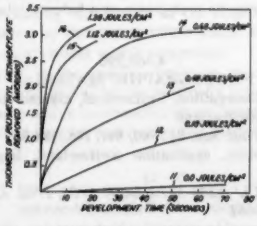


in which p is a number of 1 or 2 and R_2, X and Y have the same meaning as defined above.

4,360,585
METHOD OF ETCHING POLYMETHYL METHACRYLATE

Paul A. Frank, and Bruce F. Griffing, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 21, 1981, Ser. No. 294,967
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 430—312 5 Claims



1. A method of forming a first pattern in a first layer of polymethyl methacrylate formed on the surface of a substrate comprising:

providing said substrate having said surface,

forming said first layer of polymethyl methacrylate on said surface,

forming a second layer of a resist containing a novalak resin on said first layer of polymethyl methacrylate,

forming in said second layer a second pattern which is substantially identical to said first pattern to expose portions of said first layers of polymethyl methacrylate uncovered thereby,

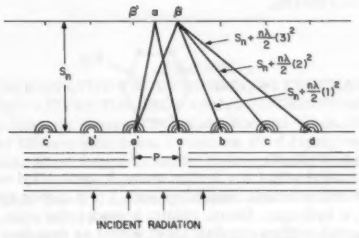
irradiating said second layer and said exposed portions of said first layer of polymethyl methacrylate with radiation to which polymethyl methacrylate is sensitive for a time to substantially depolymerize said exposed portions of polymethyl methacrylate,

treating said first and second layers in a solution including acetone to remove said exposed portions of said first layer of polymethyl methacrylate and said second layer of resist.

4,360,586
SPATIAL PERIOD DIVISION EXPOSING

Dale C. Flanders, Lexington, and Henry I. Smith, Sudbury, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 43,310, May 29, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 140,150
Int. Cl.³ B05D 3/06; G03F 9/00
U.S. Cl. 430—321 8 Claims



1. A method for producing gratings which method includes the steps of,

exposing a substrate to X-ray radiant energy of wavelength λ through a parent mask having a pattern of slits of period p defined by X-ray absorbing material with sufficient attenuation to produce with the X-ray energy transmitted through said parent mask a sharp image on said substrate,

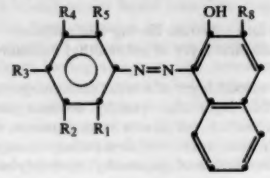
and spacing said parent mask from said substrate a distance S substantially equal to $p^2/n\lambda$ where λ is the wavelength of said X-radiation and n is an integer greater than one to provide said image with an intensity pattern of period p/n on said substrate.

4,360,587
SILVER-FREE LIGHT-SENSITIVE MATERIAL

Carmen Haessner geb. Michael, Wolfen; Heinz Mustroph, and Jörg Marx, both of Dessau, all of German Democratic Rep., assignors to VEB Filmfabrik Wolfen, Wolfen, German Democratic Rep.

Filed Aug. 10, 1981, Ser. No. 291,659
Claims priority, application German Democratic Rep., Oct. 3, 1980, 224306
Int. Cl.³ G03C 1/52
U.S. Cl. 430—332 31 Claims

1. A silver-free, light sensitive composition, comprising an organic polyhalide compound capable of splitting into reactive radicals when exposed to ultraviolet rays, and an azo dyestuff of the general formula

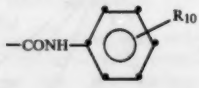


wherein

R_1, R_2, R_3, R_4, R_5 are the same or different and are hydrogen, fluoro, chloro, bromo, iodo, hydroxy, nitro, cyano, acetyl, acetylamino, trifluoromethyl, alkyl with 1 to 6 carbon atoms, alkoxy with 1 to 6 carbon atoms, cyanoalkoxy with 1 to 4 carbon atoms, fluorinated alkoxy with 1 to 4 carbon atoms,

R_6, R_7 are the same or different and are aralkyl, cyanoalkyl, alkyl with 1 to 6 carbon atoms, hydroxyalkyl with 1 to 6 carbon atoms, R_6 and R_7 together form a 5- or 6-membered heterocyclic ring or a 5- or 6-membered heterocyclic ring with an additional heteroatom,

R_8 is hydrogen, hydroxy, alkoxy with 1 to 6 carbon atoms; —CONHR$_9$,



—CONR$_{11}$R$_{12}$;

R_9 is alkyl with 1 to 6 carbon atoms, hydroxyalkyl with 1 to 6 carbon atoms, aminoalkyl with 1 to 6 carbon atoms,

R_{10} is hydrogen, fluoro, chloro, bromo, iodo, nitro, cyano, acetyl, trifluoromethyl, alkyl with 1 to 6 carbon atoms, alkoxy with 1 to 6 carbon atoms,

R_{11}, R_{12} are the same or different and are alkyl with 1 to 6 carbon atoms, aralkyl, R_{11} and R_{12} together form a 5- or 6-membered heterocyclic ring, or a 5- or 6-membered heterocyclic ring with an additional heteroatom.

4,360,588

PHOTOGRAPHIC ELEMENT CONTAINING A UV-FILTER LAYER

Stephen R. Postle, Brentwood, England, assignor to Ciba-Geigy AG, Basle, Switzerland

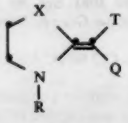
Filed Aug. 10, 1981, Ser. No. 291,698

Claims priority, application United Kingdom, Aug. 29, 1980, 8028072

Int. Cl.³ G03C *1/78*

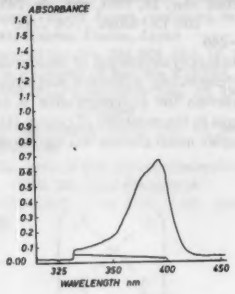
U.S. Cl. 430—512 **13 Claims**

1. A light-sensitive photographic element which contains a silver halide emulsion layer non-light sensitive uv-filter layer comprising a compound of the general formula



(1)

wherein R is alkyl, sulphoalkyl, carboxyalkyl, alkaryl or aryl, X is —S—, —CH$_2$— or —C(CH$_3$)$_2$—, T and Q are each an organic grouping or together complete a carbocyclic or heterocyclic ring, there being present in at least one of T or Q or in the ring which together they complete at least one electron



withdrawing group selected from the group consisting of =C=O, —CN and —SO$_2$R′, wherein R′ is alkyl or aryl or —OR″, wherein R″ is alkyl or aryl or hydrogen or R′ is —NHR‴, wherein R‴ is hydrogen or alkyl or aryl.

4,360,589

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Tetsuro Kojima; Masakazu Morigaki; Tsutomu Hamaoka, and Satoru Sawada, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

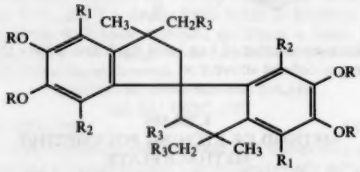
Filed May 14, 1981, Ser. No. 263,805

Claims priority, application Japan, May 14, 1980, 55-63528

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—551 **9 Claims**

1. A silver halide color photographic light-sensitive material comprising a base having thereon at least one photographic layer containing a compound represented by the following general formula:



where R represents an alkyl group or an alkenyl group, R_1 and R_2 each represent hydrogen, a halogen atom, an alkyl group, an aralkyl group, an alkenyl group, an alkoxy group or an alkenoxy group, and R_3 represents hydrogen, an alkyl group, an aralkyl group, an alkenyl group or an aryl group, wherein R_4, R_5 and R_6 each represent an alkyl group, an aralkyl group, an alkenyl group, an aryl group or a heterocyclic group.

4,360,590

PHOTOGRAPHIC MATERIAL

Ivan Tomka, Bourguillon, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Sep. 5, 1980, Ser. No. 184,567

Claims priority, application Switzerland, Sep. 12, 1979, 8253/79

Int. Cl.³ A23J *1/10*; G03C *1/00, 1/02, 1/72*

U.S. Cl. 430—642 **10 Claims**

1. A photographic material which contains, on a base, in at least one layer, as a binder, gelatin which contains microgel,

oligomers of α-gelatin, α-gelatin and fragments of α-gelatin (peptides), wherein the gelatin contains less than 25 percent by weight of fragments of α-gelatin (peptides) with a molecular weight of not more than 9×10^4.

4,360,591

PROCESS FOR THE DETERMINATION OF FREE FATTY ACIDS

Hideaki Yamada; Sakayu Shimizu; Yoshiki Tani, all of Kyoto, and Kanzo Yamashita, Aichi, all of Japan, assignors to Amano Pharmaceutical Co., Ltd., Aichi, Japan

Filed Dec. 2, 1980, Ser. No. 212,225

Claims priority, application Japan, Dec. 12, 1979, 54-160293

Int. Cl.³ C12Q *1/00, 1/48, 1/28, 1/26*

U.S. Cl. 435—4 **1 Claim**

1. In a process for determining the presence of free fatty acids in a system comprising a first reaction (1) in which an acyl coenzyme A synthetase is reacted with said free fatty acids in the presence of adenosine triphosphate and a coenzyme A to yield an acyl coenzyme A and a second reaction (2) in which said acyl coenzyme A produced in the first reaction is reacted with an acyl coenzyme A oxidase to form hydrogen peroxide and determining the amount of free fatty acids by correlating the amount of hydrogen peroxide produced to the amount of fatty acids present in the system, the improvement in which myokinase is added to the first reaction system in an amount ranging from about 1 to about 20 units, said amount being sufficient to promote the rapid and complete formation of the acyl coenzyme A in the first reaction, which in turn permits a rapid and precise determination of the amount of free fatty acids in the system.

4,360,592

PROCESS FOR THE DETECTION OF ANTIBODIES

Joel K. Weltman, 164 Summit Ave., Providence, R.I. 02906

Division of Ser. No. 93,607, Nov. 13, 1979, Pat. No. 4,251,445, which is a division of Ser. No. 889,726, Mar. 24, 1978, Pat. No. 4,218,539. This application Nov. 10, 1980, Ser. No. 208,234

Int. Cl.³ G01N *33/54*

U.S. Cl. 435—7 **15 Claims**

1. In a process for the detection and determination of a macromolecular substance in a biological fluid, which process comprises:

(a) providing a solid support material which adheres specifically to the macromolecular substance to be detected and determined:

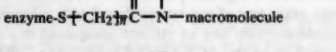
(b) contacting the support material with a biological fluid containing the macromolecular substance, to bind the macromolecular substance to the support material;

(c) removing the unbound substance of the biological fluid;

(d) adding an enzyme conjugate to the support material containing the bound macromolecular substance, to bind the enzyme conjugate in proportion to the amount of the bound macromolecular substance; and

(e) determining the amount of the bound macromolecular substance by the activity of the bound enzyme conjugate, the improvement which comprises:

employing, as the enzyme conjugate, an enzyme-conjugate compound having an enzymatically active enzyme and an immuno-active macromolecule enzymatically linked by a coupling reagent and having the formula:



wherein n is a whole number of from 1 to 8.

4,360,593

PROCESS OF PRODUCING A PEPTIDE ANTIBIOTIC WITH *BACILLUS CIRCULANS*

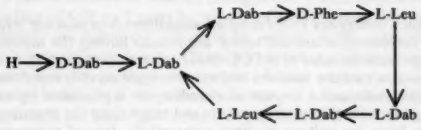
Masataka Konishi; Takeo Miyaki, both of Yokohama; Hiroshi Tsukiura, Mitaka, and Hiroshi Kawaguchi, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 250,987, Apr. 3, 1981, Pat. No. 4,341,768. This application Feb. 8, 1982, Ser. No. 346,451

Int. Cl.³ C12P *21/02;* C12R *1/09*

U.S. Cl. 435—70 **9 Claims**

1. A process for producing the peptide antibiotic Bu-2470A of the formula



wherein Dab represents α,γ-diaminobutyric acid, Leu represents leucine and Phe represents phenylaline which comprises cultivating a Bu-2470A-producing strain of *Bacillus circulans* under submerged aerobic conditions in an aqueous nutrient medium containing assimilable sources of nitrogen and carbon until a substantial amount of Bu-2470A is produced by said organism in said culture medium and then recovering the Bu-2470A antibiotic from the culture medium substantially free of co-produced substances.

4,360,594

PROCESS FOR PRODUCING L-TRYPTOPHAN OR DERIVATIVES THEREOF USING MICROORGANISMS

Akio Mimura; Yasuyuki Takahashi; Katsumi Yuasa, all of Fuji, and Mitsuru Shibukawa, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1981, Ser. No. 274,567

Claims priority, application Japan, Jun. 17, 1980, 55-80917; Jun. 17, 1980, 55-80918

Int. Cl.³ C12P *13/22;* C12N *1/20;* C12R *1/01, 1/22*

U.S. Cl. 435—108 **16 Claims**

1. A process for producing L-tryptophan or a derivative thereof, wherein an indole compound is reacted with serine, or with pyruvic acid and/or its salt and ammonium ion, in the presence of a culture or treated culture of a microorganism of genus Aeromonas or genus Klebsiella having the ability to produce L-tryptophan or a derivative thereof from an indole compound and serine, or from an indole compound, pyruvic acid and/or its salt, and ammonium ion, said microorganism of genus Klebsiella being selected from the group consisting of Klebsiella SP. AST 148-1 having the FERM designation FERM-P 5541 and Klebsiella SP. AST 151-7 having the FERM designation FERM-P 5542.

4,360,595

FERMENTATION PROCESS FOR PRODUCING ANANDIMYCIN

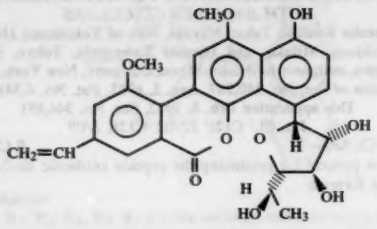
David M. Balitz, Syracuse; James A. Bush, Fayetteville; Frances A. O'Herron, Syracuse, and Donald E. Nettleton, Jr., Jordan, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,381

Int. Cl.³ C12P *17/18;* C12R *1/465*

U.S. Cl. 435—119 **1 Claim**

1. A process for producing the antitumor antibiotic anandimycin having the formula



which comprises cultivating an anandimycin-producing strain of *Streptomyces anandii* subsp. *araffinosus* having the identifying characteristics of ATCC 31431, or a mutant thereof, in an aqueous nutrient medium under submerged aerobic conditions until a substantial amount of anandimycin is produced by said organism in said culture medium and recovering the anandimycin from the culture medium substantially free of substances co-produced therewith.

4,360,596

PROCESS FOR THE PREPARATION OF CHOLESTEROL ESTERASE

Klaus Beaucamp; Michael Nelboeck; Helmgard Gauhl; Hans Seidel, all of Tutzing; Wolfgang Gruber, Tutzing-Unterzeismering, and Herwig Brunner, Weilheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 6, 1980, Ser. No. 175,809

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1979, 2933648

Int. Cl.³ C12N *9/18*

U.S. Cl. 435—197 **5 Claims**

1. Process for obtaining cholesterol esterase from microorganisms, which process comprises culturing Psuedomonas sp. DSM 1280 or DSM 1281 in a culture medium in the presence of an inducer, and recovering the enzyme obtained from the culture medium or the cells.

4,360,597

STREPTOMYCES PLASMID AND CULTURE

Mervyn J. Bibb, Menlo Park, Calif., and David A. Hopwood, Norwich, England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB79/00095, § 371 Date Jan. 24, 1980, § 102(e) Date Jan. 24, 1980, PCT Pub. No. WO79/01169, PCT Pub. Date Dec. 27, 1979

PCT Filed Jun. 1, 1979, Ser. No. 190,322

Claims priority, application United Kingdom, Jun. 1, 1978, 26219/78; Apr. 26, 1979, 7914519; May 25, 1979, 7918420

Int. Cl.³ C12N *1/20, 15/00, 1/00, 1/02*; C12Q *1/04*

U.S. Cl. 435—253 **6 Claims**

2. A Streptomyces plasmid selected from the group consisting of the plasmids isolable, respectively, from the strains of microorganism deposited with the NCIB under the reference numbers 11417, 11499, 11500, 11501, 11502, and 11503, said plasmid having the structural features given in the following Table

Plasmid	Estimated Size Md	Restriction Sites for the Endonucleases E, H, G, B, P					Extra Segment (Inserted from left hand to right hand end in clockwise fashion into portion of SLP 1.6 shown as thickened line in the FIG.)
		E	H	G	B	P	
SLP 1.6	6.25	1	2	2	0	0	None
SLP 1.4	6.4	1	3	2	0	0	H
SLP 1.3	6.88	1	3	3	0	0	H G
SLP 1.1	7.13	1	3	3	0	1	H G P
SLP 1.5	7.28	1	3	3	0	1	H G P
SLP 1.2	8.23	1	3	3	1	2	H G P P B

and being in isolated form.

4,360,598

ZIRCONIA CERAMICS AND A METHOD OF PRODUCING THE SAME

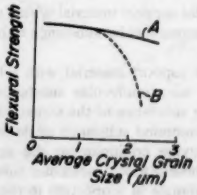
Tadashi Otagiri; Tetsuo Watanabe, both of Nagoya, and Syunzo Mase, Tobishima, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 19, 1981, Ser. No. 245,280

Claims priority, application Japan, Mar. 26, 1980, 55-37552; Feb. 17, 1981, 56-20833

Int. Cl.³ C04B *35/48*

U.S. Cl. 501—103 **6 Claims**



1. Zirconia ceramics consisting essentially of ZrO_2 and Y_2O_3 in a molar ratio of Y_2O_3/ZrO_2 of 2/98~7/93, and consisting of crystal grains having a mixed phase consisting essentially of tetragonal phase and cubic phase or having a phase consisting essentially of tetragonal phase, the average size of said crystal grains being not larger than 2 μm.

3. A method of producing zirconia ceramics consisting of crystal grains having a mixed phase consisting essentially of tetragonal phase and cubic phase or having a phase consisting essentially of tetragonal phase, said crystal grains having an average grain size of not larger than 2 μm, wherein a mixture of zirconium oxide and an yttrium compound in a molar ratio, calculated as oxide, of Y_2O_3/ZrO_2 of 2/98~7/93 is molded into a molded article, and the molded article is fired at a tem-

perature within the range of 1,000°~1,550° C., wherein said zirconium oxide has a crystallite size of not larger than 700 A.

4,360,599

STABILIZING CLAY SOIL WITH DRY CHEMICAL MIXTURES

Tor Loken, and Odd R. Bryhn, both of Oslo, Norway, assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 9, 1981, Ser. No. 281,752
Int. Cl.³ C04B *33/13*
U.S. Cl. 501—147 **15 Claims**

1. A method of stabilizing clay soil comprising admixing the clay soil with an effective amount of a dry mixture of chemicals comprising hydroxy-aluminum and a chemical selected from the group consisting of potassium chloride, potassium nitrate, potassium sulfate, ammonium chloride, ammonium nitrate, and ammonium sulfate.

4,360,600

PROCESS FOR PRODUCING ETHYLENE GLYCOL AND METHANOL

Leonard Kaplan, Dunbar, W. Va., and Robert G. Bergman, Kensington, Calif., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1981, Ser. No. 278,899
Int. Cl.³ C07C *27/06*
U.S. Cl. 518—700 **10 Claims**

1. The process for making the products ethylene glycol, methanol, and derivatives thereof directly from the reaction of hydrogen and oxides of carbon which comprises carrying out said process in a liquid phase containing an effective amount of a ruthenium carbonyl catalyst and an organosilicon compound, having at least one hydrogen bonded to silicon, said process being carried out at a temperature between about 50° C. and 400° C. and a pressure between about 100 psia (7.0 Kg/cm^2) and 15,000 psia (1,054.6 Kg/cm).

4,360,601

PROCESS FOR EXTRACTION OF FLUORINATED COPOLYMERS WITH FLUOROCARBONS

Terry M. Copeland, and Paul R. Resnick, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1980, Ser. No. 214,997
Int. Cl.³ B01J *39/00*; C08F *6/00*
U.S. Cl. 521—27 **14 Claims**

1. A process comprising extracting a fluorinated polymer having —COOR functional groups, where R is lower alkyl, with a liquid compound having the formula:

$$C_jCl_gF_fH_h,$$

where:

j is an integer of at least 1,

each of g, f and h is zero or an integer of at least 1,

provided that g+f+h is 2j+2 in the case of alkanes, and is 2j in the case of cycloalkanes, and

further provided that the normal boiling point is in the range of 30° to 125° C.,

said extraction being carried out for a total period of time of from 15 minutes to 72 hours at a pressure in the range of 10^4 to 10^6 pascals, and drying the resulting extracted polymer.

4,360,602

FOAMED CHLORINATED POLYVINYL CHLORIDE AND COMPOSITIONS FOR MAKING SAME

Samuel D. Nehmey, Lorain, and James W. Summers, Bay Village, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 14, 1981, Ser. No. 301,906
Int. Cl.³ C08J *9/10*
U.S. Cl. 521—95 **10 Claims**

1. A foam product comprising expanded chlorinated polyvinyl chloride resin having a minimum chlorine content of at least 60% by weight composed of numerous cells throughout containing 5 to 50 parts by weight of a chlorofluoroalkane of 1 to 2 carbon atoms and retained nitrogen that is a decomposition product of 0.01 to 2 parts by weight of azodicarbonamide, all amounts are based on 100 parts by weight of the resin, the azodicarbonamide forms cell nuclei containing nitrogen as a decomposition product thereof which cell nuclei form expanded cells when the chlorofluoroalkane is introduced and expanded, the foam has a density of less than 20 lbs/ft^3, at least 60% of the cells in the foam are closed cells, and the cells are smaller than 500 microns, said product being devoid of a substantial amount of an inorganic powdery substance and a substantial amount of a solvent for the resin.

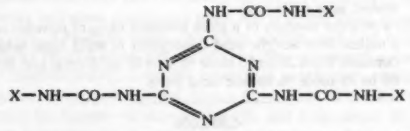
4,360,603

PROCESS FOR THE PREPARATION OF COMPOUNDS CONTAINING S-TRIAZINE UNITS AND ISOCYANATE GROUPS OR ISOCYANATE-REACTIVE GROUPS AND THE PRODUCTION OF POLYURETHANES CONTAINING THESE FILLERS

Gerhard Grögler, Leverkusen; Werner Rasshofer, and Richard Kopp, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,331
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045470
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—159 **5 Claims**

1. A process for the preparation of compounds containing s-triazine units and isocyanate groups or isocyanate-reactive groups, which compounds are capable of melting without decomposition and are suitable for use as fillers which can be chemically fixed in polyurethanes, characterized in that triisocyanates corresponding to the formula



wherein

X denotes a group obtained by removal of the more highly reactive isocyanate group from an aromatic diisocyanate having isocyanate groups differing in their reactivity in the isocyanate addition reaction,

are reacted with at least difunctional compounds containing isocyanate-reactive groups, using an equivalent ratio of isocyanate groups to isocyanate-reactive groups of at least 1.5:1 or an equivalent ratio of isocyanate-reactive groups to isocyanate groups of at least 1.5:1.

4,360,604

POLYIMIDE FOAMS

John Gagliani, Schaumburg; Raymond Lee, and Usman A. K. Sorathia, both of Elk Grove Village, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Division of Ser. No. 252,902, Apr. 10, 1981, Pat. No. 4,332,656.
This application Dec. 7, 1981, Ser. No. 327,929
Int. Cl.³ C08G 69/32
U.S. Cl. 521—189 10 Claims

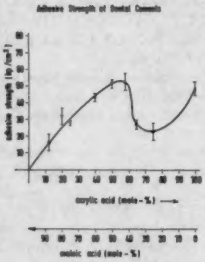
1. That method of preparing a polyimide foam precursor which comprises the steps of: dissolving 3,3',4,4'-benzophenonetetracarboxylic acid or an anhydride of that acid in one or more alkyl alcohols to form one or more alkyl diesters of the acid; dissolving a heterocyclic diamine and a meta- or para-substituted diamine in said alcohol(s) in amounts such that the imide forming functionalities of the diester(s) and the diamines are substantially equimolar and the molar ratio of heterocyclic diamine to tetracarboxylic acid ester(s) is in the ratio of about 0.4–0.42 to 1.0; and thereafter evaporating excess alcohol(s) from, and reducing the mixture of ester(s) and diamines to, a dry particulate form.

4,360,605

MIXING COMPONENT FOR DENTAL GLASS IONOMER CEMENTS

Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum, Hechendorf, and Oswald Gasser, Seefeld, all of Fed. Rep. of Germany, assignors to Espe Fabrik pharmazeutischer Praparate GmbH, Seefeld, Fed. Rep. of Germany

Filed Aug. 5, 1980, Ser. No. 175,389
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1979, 2932823
Int. Cl.³ C08K 3/40
U.S. Cl. 523—116 10 Claims



1. A two component mixing preparation for glass ionomer cements selected from the group consisting of:

(a) a glass ionomer cement powder and an aqueous solution containing from about 20 to 65% by weight of a maleic acid-acrylic acid copolymer which contains from 20 to 65 mole % acrylic acid units and from 80 to 35 mole % maleic acid units, and

(b) a powder mixture of a glass ionomer cement powder and a maleic acid-acrylic acid copolymer in solid form which contains from 20 to 65 mole % acrylic acid units and from 80 to 35 mole % maleic acid units.

4,360,606

PHOTO-DEGRADABLE POLYMER COMPOSITIONS

John W. Tobias, East Lansing, and Lynn J. Taylor, Haslett, both of Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 301,199, Oct. 26, 1972, abandoned.
This application Mar. 11, 1977, Ser. No. 776,693
The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.
Int. Cl.³ C08K 5/17, 5/08, 5/07
U.S. Cl. 523—124 45 Claims

1. As a composition of matter, a polymeric material containing a degradation-controlling amount of an additive system consisting essentially of at least one photosensitive aliphatic or aromatic ketone and at least one readily autoxidizable olefinic compound, said olefinic compound being an amine having at least one olefinic group.

3. As a composition of matter, a polymeric material containing a degradation-controlling amount of an additive system consisting essentially of at least one photosensitive aliphatic or aromatic ketone and at least one readily autoxidizable olefinic compound, said readily autoxidizable olefinic compound being an olefinic ether.

5. As a composition of matter, a polymeric material containing a degradation-controlling amount of an additive system consisting essentially of at least one photosensitive aliphatic or aromatic ketone and at least one readily autoxidizable olefinic compound, said readily autoxidizable olefinic compound being an olefinic acetal.

7. As a composition of matter a polymeric material containing a degradation-controlling amount of an additive system consisting essentially of at least one photosensitive aliphatic or aromatic ketone and at least one readily autoxidizable olefinic compound, said readily autoxidizable olefinic compound being an olefinic formal.

9. As a composition of matter, a polymeric material containing a degradation-controlling amount of an additive system consisting essentially of at least one photosensitive aliphatic or aromatic ketone and at least one readily autoxidizable olefinic compound, said readily autoxidizable olefinic compound being an olefinic alcohol.

4,360,607

MICROWAVE ENERGY SENSITIZING CONCENTRATE

Agmund K. Thorsrud, and Roy W. Siedenstrang, both of Stow, Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 4, 1979, Ser. No. 72,396
Int. Cl.³ C08L 25/10
U.S. Cl. 523—137 15 Claims

1. A composition of matter which on addition to a non-polar thermoplastic composition is suitable for sensitizing said thermoplastic composition to the heating effects of microwave energy, said composition comprising an admixture of (1) from about 10 to about 50 weight percent of simple and polymeric alkylene glycols and their mono- and dialkyl esters, (2) about 10 to about 50 weight percent of ethanolamines isopropanolamines and their hydrocarbyl-substituted derivatives, (3) about 20 to about 75 weight percent silica and (4) a linear or radial teleblock copolymer plastomer derived from butadiene and styrene in which the butadiene to styrene ratio can vary from about 85:15 to about 55:45 parts by weight said plastomer in an amount ranging from a finite amount up to about 40 weight percent.

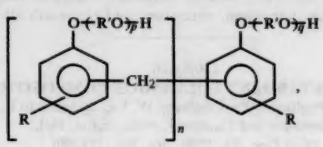
4,360,608

EPOXY RESIN-BITUMEN MATERIAL COMPOSITION

Kenji Hijikata, Yokkaichi, and Kouichi Sakaguchi, Tsu, both of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed May 28, 1981, Ser. No. 268,057
Claims priority, application Japan, May 31, 1980, 55-73471
Int. Cl.³ B22C 11/22
U.S. Cl. 523—450 17 Claims

1. An epoxy resin-bitumen material composition comprising an epoxy resin, a bitumen material selected from a class consisting of asphalts and lubricating oils and a mixture of novolak-based polyether-polyols represented by the general formula:



[II]

wherein R is hydrogen or a hydrocarbyl group having 1–9 carbon atoms, R' represents —CH_2—CH_2— or —CH_2—CH-2—CH_2—, n is an integer of 1–10 inclusive, and each of p and q is an integer within the range of 0–40 and the average value of each in the mixture is 3–30.

4,360,609

CHAR-FORMING THERMOPLASTIC COMPOSITIONS

Charles E. Reineke, and Kent S. Dennis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 28, 1981, Ser. No. 334,870
Int. Cl.³ C09K *3/28*
U.S. Cl. 523—179 **10 Claims**

1. A char-forming aromatic polymer composition comprising:
   (a) a monovinylidene aromatic polymer,
   (b) a char-forming amount of a plurality of active benzyl carbon and/or active allyl carbon moieties, and
   (c) a catalyzing amount of an arylsulfonate ester compound wherein the arylsulfonate ester compound comprises one or more arylsulfonate ester moieties of the formula: Ar—SO_3—CH_2—, wherein Ar is an unsubstituted or inertly substituted aryl group.

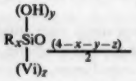
4,360,610

METHOD OF IMPROVING SILICONE RUBBER COMPOSITION

Milton C. Murray, Bay City, and Joan M. Donatelli, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 23, 1981, Ser. No. 246,348
Int. Cl.³ C08K *3/36*; C08L *83/06*
U.S. Cl. 523—212 **21 Claims**

1. A method of producing a silicone rubber composition comprising
   (I) mixing
      (A) 100 parts by weight of polydiorganosiloxane gum having a viscosity of greater than 1000 Pa.s at 25° C., wherein the organic radicals are selected from the group consisting of methyl, phenyl, vinyl, and 3,3,3-trifluoropropyl, at least 50 percent of the organic radicals being methyl and less than 2 percent being vinyl,
      (B) from 10 to 85 parts by weight of treated reinforcing silica filler having a surface area of greater than 50 m^2/g,
      (C) from 0.1 to 5 parts by weight of a hydroxylated organosilicon compound having the average unit formula



   in which R is methyl, phenyl or 3,3,3-trifluoropropyl, Vi is vinyl, x has a value from 1.0 to 2.0 inclusive, y has a value such that there is present an average of from 1 to 20 percent by weight hydroxyl radical, z has a value such that there is present an average of from 1 to 31 percent by weight vinyl radical, and the compound is soluble in (A); then
   (II) heating the mixture to a temperature of from 60° to 250° C. for a period of from 10 minutes to 10 days to provide a product that is stable upon storage, and then
   (III) cooling the mixture to room temperature, and admixing during the cooling process when the temperature of the mixture is below 125° C. or after room temperature has been reached from 0.1 to 2.5 parts by weight of the hydroxylated organosilicon compound of (C) and from 1 to 250 parts by weight of extending filler with a surface area of less than 50 m^2/g.

4,360,611

FINE SPHERICAL POLYMER PARTICLES AND PROCESS FOR THE PREPARATION THEREOF

Saburo Wakimoto, Hayama; Sadayasu Miyahara, Fujisawa, and Yoshihiko Hyosu, Sagamihara, all of Japan, assignors to Sinloihi Company Limited, Osaka, Japan

Filed Oct. 21, 1980, Ser. No. 199,207
Claims priority, application Japan, Oct. 23, 1979, 55-135922
Int. Cl.³ C08K *9/02*
U.S. Cl. 523—216 **2 Claims**

1. Fine spherical polymer particles with a uniform particle size distribution which comprise polymerized products from ethylenically unsaturated polymerizable monomers having at least one prepolymer involved therein, and 0.2–2 phr by weight with respect to the polymerizable monomers of an inorganic dispersion stabilizer in which said polymerizable monomers are charged with 0.1–5% by weight with respect to the polymerizable monomers of a cation or anion, which is a cationic polymerizable monomer or a difficultly water soluble organic amine or an anionic polymerizable monomer, and said inorganic dispersion stabilizer has an opposite charge to said monomers, the surface of said polymer particles being firmly bound through ionic bond to and being completely covered with said inorganic dispersion stabilizer wherein said prepolymer is 5–90% butadiene homopolymer, α,w-polybutadiene glycol, α,w-polybutadiene dicarboxylic acid, maleic-modified polybutadienes, terminally acrylic-modified polybutadienes or terminally half-esterified polybutadienes or mixtures thereof.

4,360,612

AGGLOMERATE-FREE, BUBBLE-FREE, HIGH BARRIER VINYLIDENE CHLORIDE POLYMER FILMS AND PROCESS OF PREPARATION

Walter A. Trumbull, and Angela J. Williams, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 16, 1981, Ser. No. 225,594
Int. Cl.³ C08K *3/10, 5/42*
U.S. Cl. 523—351 **10 Claims**

1. An improved process for preparing extruded vinylidene chloride copolymer film containing an effective amount of one or more inorganic particulate additives, said film being generally free of bubbles, holes and white specks, said film being made by (a) preparing a blend of (1) a dry, powdered, generally plasticizer-free, normally crystalline vinylidene chloride polymer having polymerized therein from about 70 to about 95 percent by weight vinylidene chloride and from about 30 to about 5 percent by weight of at least one monoethylenically unsaturated monomer copolymerized therewith, and (2) the inorganic particulate additives, each additive having an average particle size of greater than about 0.5 micron and less than about 40 microns, and (b) thermally fabricating said blend into film form by extrusion, the improvement which comprises making a preblend of the inorganic particulate additives with from about 0.02 to about 0.5 weight percent, based on weight of the inorganic particulate additives of an alkali metal salt of an alkylaryl sulfonic acid and admixing the preblend with the vinylidene chloride polymer.

4,360,613
ETHER-ESTER WATER REDUCIBLE COATING COMPOSITIONS

David A. Shimp, Prospect, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed May 18, 1981, Ser. No. 264,780
Int. Cl.³ C08L 63/02
U.S. Cl. 523—416 20 Claims

5. A curable coating composition comprising

(A) the reaction product of (i) about 55 to about 90 weight percent of a glycidyl polyether of a dihydric phenol having a molecular weight of about 800 to about 2500; (ii) about 8 to about 44.1 weight percent of a polyethylene glycol having a molecular weight of about 300 to about 2000; and (iii) about 0.9 to about 2 weight percent of ortho phosphoric acid;

(B) an aminoplast resin; and

(C) water,

wherein (B) is present in the amount of about 5 to about 40 weight percent based on the total weight of (A) and (B).

4,360,614
BASE SOLUBILIZATION OF AN AZOLE-FUNCTIONAL RESIN AND ELECTRODEPOSITION OF SUCH SOLUBILIZED RESIN

Nicholas T. Castellucci, Pittsburgh; John F. Grunewalder, Glenshaw, both of Pa., and John S. Ostrowski, Richardson, Tex., assignors to PPG Industries Inc., Pittsburgh, Pa.

Filed Jan. 29, 1981, Ser. No. 229,495
Int. Cl.³ C08L 63/02
U.S. Cl. 523—421 8 Claims

1. A method of imparting water solubility or dispersibility to a reaction product comprising: mixing the reaction product with a base and water, the amount of base being sufficient to impart water solubility or dispersibility to the reaction product, wherein the product results from the reaction of

(A) a N-heterocyclic compound selected from the group consisting of a triazole, a tetrazole and a mixture thereof, said N-heterocyclic compound substituted on at least one carbon atom in the N-heterocyclic ring by a group of the formula $-X)_nSH$ wherein

X represents an alkylene group containing from 1 to 6 carbon atoms optionally halogen substituted, a cycloalkylene group containing from 5 to 8 carbon atoms optionally halogen substituted, or a phenylene group optionally substituted by halogen and/or an alkyl group containing from 1 to 6 carbon atoms, and n represents 0 or 1, and

(B) a polyepoxide containing 1,2-epoxy groups, wherein the ratio of equivalents of said N-heterocyclic compound to epoxide equivalents of said polyepoxide is from about 0.5:1.0 to about 1.5:1.0.

4,360,615
ADDITION AGENT COMPOSITION

Samuel S. Wang, Cheshire, and Morris E. Lewellyn, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 9, 1981, Ser. No. 241,908
Int. Cl.³ C08L 95/00; C21C 7/04; C22B 9/00
U.S. Cl. 524—9 29 Claims

1. An addition agent composition which comprises a blend of an addition agent with a modified tall oil pitch binder wherein the modified tall oil pitch binder comprises an organic or inorganic filler and a tall oil pitch that is chemically modified with a polycarboxylic acid, a polyamine, a polyol, a polyisocyanate, an epoxy resin or a combination thereof.

2. The composition of claim 1 wherein the addition agent is selected from the group consisting of aluminum, boron, calcium, chromium, cobalt, copper, manganese, molybdenum, molybdenum oxide, nickel, nickel oxide, niobium, nitrogen, phosphorus, selenium, silicon, tantalum, titanium, tungsten, tungsten oxide, vanadium, zirconium, and rare-earth alloys.

4,360,616
FLAME-RETARDANT POLYAMIDE COMPOSITIONS

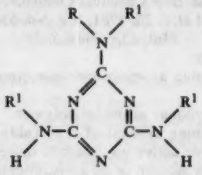
Rolando U. Pagilagan, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 31, 1980, Ser. No. 221,888
Int. Cl.³ C08K 5/34
U.S. Cl. 524—100 9 Claims

1. A reinforced, flame-retardant, arc track resistant composition consisting of

(a) 40–65 weight percent of composition of a polyamide of film-forming molecular weight,

(b) 16–35 weight percent of composition of melamine, melam, melamine cyanurate or a melamine derivative represented by the formula



where R and R^1 may be the same or different and represent hydrogen, lower alkyl (alkyl of 1–6 carbons), phenyl, tolyl or halo-phenyl, provided that not all the R and R^1 groups can be hydrogen,

(c) 1–7 weight percent of composition selected from the class consisting of a chlorinated compound obtained from condensation of two moles of perchlorocyclopentadiene and one mole of 1,5-cyclooctadiene, or a brominated polystyrene.

(d) 1–4.9 weight percent of composition of zinc borate or zinc oxide

(e) 5–30 weight percent of composition of glass fibers,

the percent amounts of components (a) through (e) totaling 100% with respect to one another.

4,360,617
STABILIZER SYSTEMS OF TRIARYLPHOSPHITES AND PHENOLS

Helmut Müller, Binningen, and Kurt Schwarzenbach, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

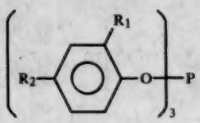
Continuation of Ser. No. 112,772, Jan. 17, 1980, abandoned, which is a continuation of Ser. No. 904,917, May 3, 1978, abandoned, which is a continuation of Ser. No. 762,918, Jan. 27, 1977, abandoned. This application Feb. 23, 1981, Ser. No. 237,041
Claims priority, application Switzerland, Feb. 5, 1976, 1410/76
Int. Cl.³ C08K 5/52
U.S. Cl. 524—101 10 Claims

1. A stabilized composition consisting essentially of

(a) a polymer which is polybutadiene, polyisoprene, polystyrene, a styrene copolymer, a styrene graft polymer, a halogen-containing vinyl polymer or copolymer, a polymer derived from an alpha,β-unsaturated acid, a polyacrylate, a polymethacrylate, a polyacrylic amide, polyacrylonitrile, a polymer derived from an unsaturated alcohol or its acyl or acetyl derivatives, a polyacetal, a polyurethane, a polycarbonate, a polyamide or a polyester, and

(b) from 0.005 to 5% by weight of component (a) of a mixture of

(1) a triaryl phosphite of the formula



wherein

R_1 represents tert-butyl or 1,1-dimethylpropyl,

R_2 represents methyl, tert-butyl or 1,1-dimethylpropyl, and

(2) a hindered phenolic antioxidant selected from the group consisting of 2,6-di-tert-butyl-4-methylphenol, 1,3,5-tris(3,5-di-tert-butyl-4-hydroxybenzyl) isocyanurate, n-octadecyl 3,5-di-tert-butyl-4-hydroxyhydrocinnamate, 1,3,5-tris-(3,5-di-tert-butyl-4-hydroxybenzyl)-2,4,6-trimethylbenzene, hexamethylene bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamate), pentaerythrityl tetrakis(3,5-di-tert-butyl-4-hydroxyhydrocinnamate), 2,2'-methylene-bis(4-methyl-6-tert-butylphenol) and N,N'-hexamethylene-bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamamide), with the ratio of the phosphite to antioxidant being 10:1 to 1:5.

4,360,618

LOW ACRYLONITRILE CONTENT STYRENE-ACRYLONITRILE POLYMERS BLENDED WITH POLYPHENYLENE OXIDE

Quirino A. Trementozzi, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1981, Ser. No. 322,803
Int. Cl.³ C08K *5/52;* **C08L** *25/10, 25/12*
U.S. Cl. 524—141 **6 Claims**

1. A polyblend comprising:

A. from 10 to 90% by weight of a polyphenylene oxide; and

B. from 90 to 10% by weight of a polymer comprising:

from 2 to 8% by weight of an unsaturated nitrile monomer;

from 72 to 98% by weight of a vinylaromatic monomer; and

from 0 to 20% by weight of a rubber having a glass transition temperature below 0° C.

5. A polyblend according to any one of claims 1 to 3 that comprises a triaryl phosphate.

4,360,619

STABILIZER COMPOSITIONS AND POLYMERS CONTAINING SAME

Thomas G. Kugele; Keith A. Mesch, and Karl R. Wursthorn, all of Cincinnati, Ohio, assignors to Carstab Corporation, Reading, Ohio

Filed Feb. 26, 1981, Ser. No. 238,299
Int. Cl.³ C08K *5/58, 5/57*
U.S. Cl. 524—181 **37 Claims**

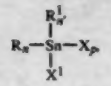
1. A composition for stabilizing halogen containing polymers comprising:

A. about 40% to about 90% of an organotin compound or mixture of organotin compounds having one or more tetravalent tin atoms which each have at least one direct tin to carbon bond selected from compounds having the formulas:

(I)

(II)

-continued



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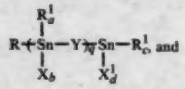

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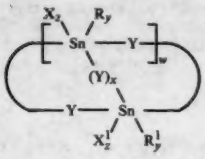


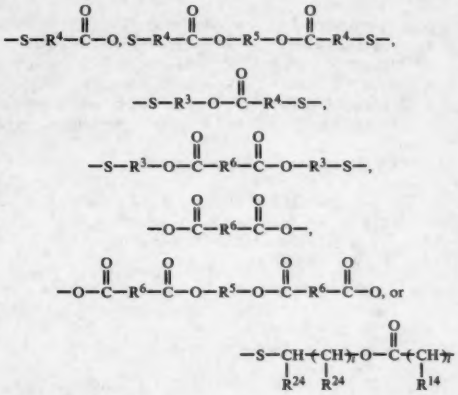
(V)

wherein

X and X^1 are the same or different and are selected from $-SR^2$, Cl, Br, I,

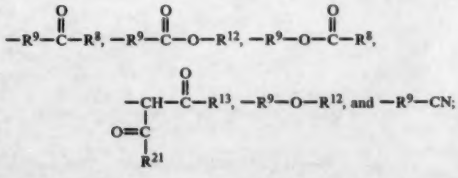
and $O-R^8$ with the proviso that in formula (II) when $t=1$, in formula (V) when $z=1$ and in formulas (III) and (IV) at least one X or X^1 is $-SR^2$;

Y is $-(S)_n-W-R^3-W^1-$,

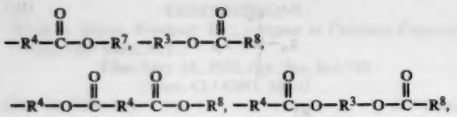


W and W^1 are the same or different and are oxygen or sulfur;

R and R^1 are the same or different and are selected from alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl,



R^2 is alkyl, alkenyl, aryl, aralkyl, cycloalkyl, cycloalkenyl,



$-R^3-S-R^7$, or $-R^3-O-R^8$;

R^3 is alkylene of at least 2 carbon atoms, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;

R^4 is alkylene, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;

R^5 is R^3;

R^6 is nothing or R^4;

R^7 is —H or R^8;

R^8 is alkyl, alkenyl, aryl, aralkyl, alkaryl, cycloalkyl, or cycloalkenyl;

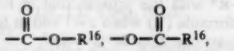
R^9 is C_1 to C_4 alkylene;

R^{12} is —H or a monovalent C_1 to C_{20} hydrocarbon radical;

R^{13} and R^{21} are the same or different and are each C_1 to C_{20} alkyl or C_1 to C_{20} alkoxy;

R^{14} is —H, aryl or C_1 to C_{18} alkyl;

R^{24} is



—OH, —SH, aryl, C_1 to C_{18} alkyl or —H;

R^{16} is —H or R^8;

i=0 or an integer from 1 to 6 inclusive;

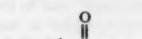
m=1 or 2 and t=0 or 1 with the proviso that m+t=2;

n=0, 1 or 2, n′=0, 1 or 2 and p=1 or 2 with the proviso that n+n′=1 or 2 and n+n′+p=3;

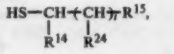
a=0, 1 or 2, b=0, 1 or 2, q=an integer from 1 to 5 inclusive, c=1, 2 or 3 and d=0, 1 or 2 with the proviso that a+b=2 and c+d=3;

v=an integer from 1 to 8 inclusive; and

w=0, 1 or 2, x=0 or 1, y=1 or 2, z=0 or 1 with the proviso that when x=0 and w=1 or 2 then y=1 and z=1, when x=1 then y=1, z=0 and w=1, when w=2 then x=0, y=1 and z=1 and when w=0 then x=0, y=1, z=1 and Y is —W—R^3—W^1—or



B. about 10% to about 60% of a mercaptan-containing organic compound or mixture of mercaptan-containing organic compounds having the formula selected from:



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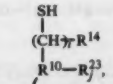

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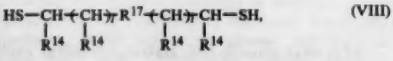

(VIII)

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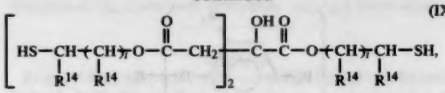

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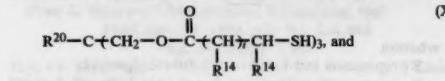

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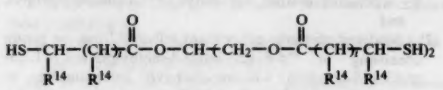


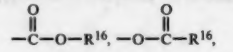
where

R^{10} is cycloalkyl, cycloalkenyl or phenyl;

R^{14} is as previously defined;

R^{24} is as previously defined;

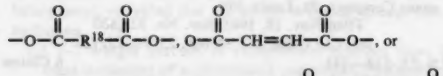
R^{15} is



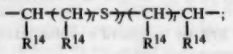
—OH, —SH, aryl, C_1 to C_{18} alkyl, or —H;

R^{16} is as previously defined;

R^{17} is

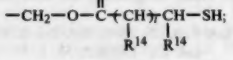


R^{18} is arylene, C_1 to C_8 alkylene, or

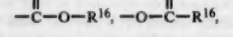


R^{19} is —H or a divalent group which may contain halogen, hydroxy, mercapto or alkyl substituents and which combines with R^{10} when R^{10} is phenyl to form a naphthalene ring;

R^{20} is $-CH_3$, $-CH_2CH_3$, or



R^{23} is



—SH, aryl, C_1 to C_{18} alkyl, —OH or —H; with the proviso that in formula (VII) when R^{10} is phenyl, R^{23} is —OH and i=0, then the —OH and —SH groups are on non-adjacent carbon atoms;

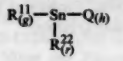
i is as previously defined;

j=0, 1, 2 or 3; and

f=1 or 2;

C. 0% to about 33% of a halogen-containing tin compound or mixture of halogen-containing tin compounds wherein the tin atom is tetravalent and has at least one halogen atom

bonded directly to it, said halogen-containing tin compound selected from compounds having the formula:

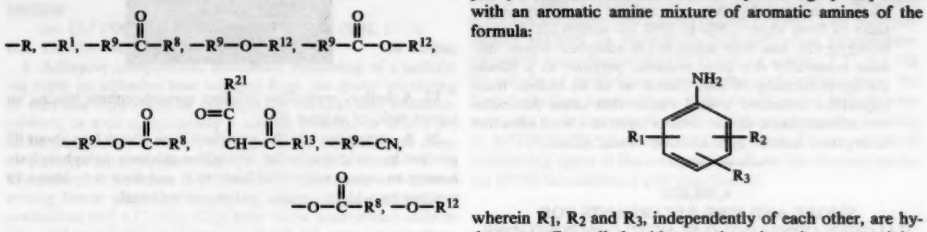


(XII)

where

Q is Cl, Br, or I;

R^{11} and R^{22} are the same or different and are selected from



where R, R^1, R^8, R^9, R^{12}, R^{13} and R^{21} are as previously defined; and

g=0, 1, 2 or 3, r=0, 1, 2, or 3 and h=1, 2, 3 or 4 with the proviso that g+r+h=4,

all percentages being by weight based on the total weight of the stabilizer composition, with the proviso that when the weight percent of the halogen-containing tin compound is 0, then at least one of the organotin compounds of component A is selected from compounds having formulas (III), (IV) or (V) wherein at least one X or X^1 is Cl, Br or I.

33. A polymer composition stabilized against the deteriorative effects of heat comprising a halogen-containing organic polymer and a stabilizingly effective amount of the composition according to claim 1.

4,360,620

RUBBER DISPERSIONS

Christian Lindner, Cologne; Lothar Liebig, and Karl-Heinz Ott, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 129,597, Mar. 12, 1980, abandoned.
This application Jul. 17, 1981, Ser. No. 283,930
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910154
Int. Cl.³ C08K *5/20, 5/32*
U.S. Cl. 524—234 1 Claim

1. A stable, free-flowing dispersion in organic liquid of a rubber in the form of discrete particles having an average diameter of from 100 to 3,000 nm, said dispersion containing

(A) from 1 to 20% by weight, based on the total dispersion, of a cross-linked diene rubber or a cross-linked, rubber-like acrylate polymer;

(B) from 0 to 15% by weight, based on the total dispersion, of water in the form of a water-in-oil emulsion and

(C) from 99 to 45% by weight, based on the total dispersion, of a mixture of from 95 to 60% by weight of a member selected from the group consisting of liquid paraffins having up to 20 carbon atoms, halogenated derivatives thereof, benzene, toluene, xylene, chlorobenzene, anisole and nitrobenzene and from 5 to 40% by weight of C_1–C_{12} alkylanol, a ketone containing up to 8 carbon atoms, a formamide or a saturated aliphatic nitrile containing up to 6 carbon atoms.

4,360,621

LOW VISCOUS P-PHENYLENE DIAMINE STABILIZERS

Osamu Kimura; Takashi Kojima, both of Toyonaka; Eizo Okino, Nishinomiya, and Hideo Nagasaki, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 16, 1981, Ser. No. 244,324
Claims priority, application Japan, Mar. 31, 1980, 55-42410
Int. Cl.³ C08K *5/18;* C07C *87/58*
U.S. Cl. 524—255 13 Claims

1. A normally liquid stabilizer for rubbers and urethane resins, which comprises, as the effective ingredient, a diaryl-p-phenylenediamine mixture obtained by reacting hydroquinone with an aromatic amine mixture of aromatic amines of the formula:

wherein R_1, R_2 and R_3, independently of each other, are hydrogen or $C_{1\text{-}18}$ alkyl, said aromatic amine mixture containing 7–26 weight % of p-ethylaniline and 8–40 weight % of 2,4-xylidine.

4,360,622

HOT MELT ADHESIVE COMPOSITIONS COMPRISING HYDROGENATED RESIN AND ETHYLENE-POLAR VINYLIC COMPOUND COPOLYMER OR WAX

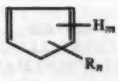
Shozo Tsuchiya, Tokyo; Akio Oshima, and Hideo Hayshi, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,398
Claims priority, application Japan, Mar. 26, 1980, 55/37541
Int. Cl.³ C08L *91/08, 23/08*
U.S. Cl. 524—275 11 Claims

1. A hot melt adhesive composition comprising

(I) a hydrogenated resin (2) having a softening point of 60°–130° C. obtained by the hydrogenation of a copolymer resin (1) prepared by copolymerizing

20–38 parts by weight of at least one ingredient (A) selected from the group consisting of five-membered cyclic compounds having conjugated double bonds and the Diels-Alder's adducts thereof, the five-membered cyclic compounds being represented by the following general formula



wherein H is hydrogen, R is an alkyl group having 1–3 carbon atoms, m and n are each zero or an integer of at least 1 with the proviso that the total of m and n is 6, with

80–62 parts by weight of at least one ingredient (B) selected from the group consisting of homodimers, codimers, homotrimers and cotrimers of at least one diene selected from the group consisting of said five-membered cyclic compounds, isoprene and piperylene, the dimers and trimers covered by the ingredient (A) being excluded, and

(II) at least one member selected from the group consisting of copolymers of ethylene and a polar vinylic compound and waxes.

4,360,623

ALKALI METAL BOROHYDRIDE CONCENTRATE USEFUL AS A STABILITY IMPROVER

Robert C. Wade, Ipswich; Lawrence J. Guilbault, Topsfield, and Nuno M. Rei, Boxford, all of Mass., assignors to Thiokol Corporation, Newtown, Pa.

Filed Jun. 12, 1981, Ser. No. 272,868
Int. Cl.³ C08K 3/38; C08L 23/12
U.S. Cl. 524—404 7 Claims

1. A process for purifying plastic during processing to enhance resistance to deterioration caused by heat or light, comprising:

adding an effective amount of a stable, substantially inert, alkali metal borohydride concentrate consisting essentially of from about 0.5% to 20% by weight alkali metal borohydride, less than about 0.1% adsorbed water, balance essentially dry inert resinous polymer to a plastic during processing of said plastic so as to reduce trace impurities contained in said plastic that cause deterioration of said plastic due to heat or light to a level effective to improve heat or light stability of said plastic.

4,360,624

SMOKE AND FIRE RETARDANTS FOR HALOGEN-CONTAINING PLASTIC COMPOSITIONS

Joseph M. G. Huang, Cranbury; Robert J. Capwell, East Windsor, and Michael A. De Sesa, Fair Haven, all of N.J., assignors to Anzon America, Inc., Freehold, N.J.

Continuation of Ser. No. 123,653, Feb. 22, 1980, abandoned, which is a continuation of Ser. No. 834,486, Sep. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 732,221, Oct. 14, 1976, abandoned. This application Feb. 13, 1981, Ser. No. 234,837
Int. Cl.³ C08K 3/22
U.S. Cl. 524—411 23 Claims

1. A flame and smoke resistant halogen-containing plastic composition, said composition containing therein from 0.5% to 10% of a solid solution of zinc oxide and an oxide selected from the group consisting of magnesium oxide, calcium oxide and mixtures thereof, the amount of magnesium oxide and calcium oxide present in said solid solution being from 0.1 to 10 parts for each part of zinc oxide, all of the percentages and parts expressed on a weight basis, said solid solution having a specific surface area of greater than about 10 M^2/g.

9. A flame and smoke resistant agent for plastic compositions, said agent comprising a mixture of antimony trioxide and a solid solution of zinc oxide and an oxide selected from the group consisting of magnesium oxide, calcium oxide and mixtures thereof, the amount of magnesium oxide and calcium oxide present in said solid solution being from 0.1 to 10 parts for each part of zinc oxide, in which there are from 0.1 to 10 parts of antimony trioxide for each part of the solid solution present in said mixture, the parts expressed on a weight basis, said solid solution having a specific surface area of greater than about 10 M^2/g.

4,360,625

ACICULAR, CRYSTALLINE CALCIUM METAPHOSPHATE

Edward J. Griffith, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 103,787, Dec. 14, 1979, abandoned. This application May 27, 1980, Ser. No. 153,667
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ C01B 25/30
U.S. Cl. 524—414 26 Claims

1. A method for producing acicular, crystalline calcium metaphosphate which comprises:

(a) forming a melt source of calcium, phosphorus, oxygen and alkali metal wherein the melt contains from about 2 mole percent to about 20 mole percent M_2O, where M is alkali metal, from about 48 mole percent to about 58 mole percent P_2O_5 and from about 27 mole percent to about 48 mole percent CaO;

(b) cooling the melt to about 550° C. to about 970° C.;

(c) inducing acicular crystal formation; and

(d) recovering the acicular crystals.

13. Acicular, crystalline calcium metaphosphate having an aspect ratio of at least 10:1.

26. A composite which comprises from about 1 to about 99 percent by weight acicular crystalline calcium metaphosphate having an aspect ratio of at least 10:1, and from 1 to about 99 percent by weight organic polymeric material.

4,360,626

OXIDATIVELY STABLE POLYIMIDE COMPOSITIONS

Carl H. Manwiller, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 24, 1981, Ser. No. 257,109
Int. Cl.³ C08L 79/08
U.S. Cl. 524—495 3 Claims

1. In a non-melt fabricable polyimide composition containing about from 5 to 75 volume percent graphite, the improvement wherein the graphite contains less than about 0.15 weight percent of at least one reactive impurity selected from the group consisting of ferric sulfide, barium sulfide, calcium sulfide, copper sulfide, barium oxide, calcium oxide, and copper oxide.

4,360,627

RUBBER COMPOSITION COMPRISING FURNACE CARBON BLACK

Yosuke Okado, Higashimurayama; Masanori Kawamura, Akigawa, and Takashi Tomioka, Higashimurayama, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jan. 29, 1981, Ser. No. 229,500
Claims priority, application Japan, Jan. 30, 1980, 55-8704
Int. Cl.³ C08K 3/04
U.S. Cl. 524—496 3 Claims

1. A rubber composition comprising 100 parts by weight of at least one of natural rubber and synthetic rubber and 20–200 parts by weight of carbon black, said carbon black being furnace carbon black having a specific surface area (N_2SA) of 85–95 m^2/g measured by the nitrogen adsorption method, a dibutyl phthalate adsorption value (24M4 DBP) of 100–110 ml/100 g, a tinting strength (TINT) of 95–105 and wherein said furnace carbon black has such a particle size that aggregates obtained from the carbon black by centrifugal sedimentation have a size distribution curve having a half value width ($\Delta D_{50}(Dst)$) of at least 180 mμ.

4,360,628

COPOLYMER TACKIFYING RESINS CONTAINING DICYCLOPENTADINE, VINYL AROMATIC HYDROCARBON AND A SUBSTITUTED BENZENE (HALOGEN, LOWER ALKYL, OR HYDROXYL) AND ADHESIVES CONTAINING THESE RESINS

Yves Runavot, St. Maur des Fosses; Georges Billault, Saint Ouen, and Jacques Salvetat, Le Vesinet, all of France, assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 167,494, Jul. 11, 1980. This application Jan. 19, 1981, Ser. No. 226,564

Claims priority, application Netherlands, Jul. 17, 1979, 7905548

Int. Cl.³ C08L *45/00, 55/00;* C08K *5/01;* C08L *91/06*

U.S. Cl. 524—508 10 Claims

1. Adhesive composition, essentially consisting of a tackifying resin, an adhesive base selected from the group consisting of ethylene vinyl-acetate copolymers, natural and synthetic rubbers, as well as optionally a wax or paraffin, in which the tackifying resin is a copolymer consisting essentially of dicyclopentadiene, a vinylaromatic hydrocarbon, a mono-, di- or tri-substituted benzene in which the substituents are chosen among lower alkyl, hydroxyl and halogen, and optionally a pentadiene and a C_1–C_{12} alkyl ester of an unsaturated carboxylic acid, in relative molar ratios of 0.7–1.5 moles of vinylaromatic compound per mole of dicyclopentadiene and 0.01–1.0 mole of substituted benzene per mole of dicyclopentadiene and 0–3 moles of pentadiene and 0–025 moles of C_1–C_{12} alkyl ester of unsaturated carboxylic acid per mole of dicyclopentadiene.

4,360,629

NONSOLVENT PRECONCENTRATION OF POLYMERIC CYCLOOLEFINS

Gerald V. Wootton, Akron; Parley C. Lane, Jr., Cuyahoga Falls, and Kong S. Yi, Parma, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 6, 1982, Ser. No. 337,547

Int. Cl.³ C08K *5/01*

U.S. Cl. 524—553 10 Claims

1. Process for preconcentrating a polymer cement that is a solution of a polymer prepared by ring opening polymerization in a nonpolar hydrocarbon solvent of at least one monomer containing the norbornene group shown below,

said process comprising mixing with said polymer cement a hydrocarbon nonsolvent in an amount sufficient to cause formation of separate phases but an insufficient amount to precipitate said polymer, and separating said phases; one of said phases being a preconcentrated polymer cement that is more viscous and contains a substantially larger proportion of solids than said polymer cement, and said nonsolvent being miscible with said nonpolar solvent but said polymer being insoluble in said nonsolvent.

4,360,630

COMPOSITIONS OF AROMATIC POLYETHERKETONES AND GLASS AND/OR CARBON FIBRES

Clive P. Smith, Wheathampstead, England, assignor to Imperial Chemical Industries Limited, London, England

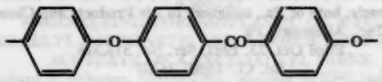
Filed Nov. 25, 1980, Ser. No. 210,529

Claims priority, application United Kingdom, Dec. 14, 1979, 7943101; May 7, 1980, 8015112

Int. Cl.³ C08L *61/00*

U.S. Cl. 524—592 8 Claims

1. A melt-fabricatable or melt-fabricated composition comprising (i) a crystalline thermoplastic aromatic polyetherketone containing the repeat unit



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alone or in conjunction with other repeat units, said polyetherketone containing at least 50% molar of the repeat unit I and having an inherent viscosity of at least 0.7 and (ii) at least one of a glass or carbon reinforcing agent, which composition is melt-fabricatable into a composition exhibiting, or melt-fabricated exhibits, an increase in heat deflection temperature, measured according to ASTM D 648, of at least 3° C. per 1% by weight of reinforcing agent in the composition above the heat deflection temperature of the unreinforced polyetherketone, and an increase in flexural modulus, measured according to ASTM D 790, of at least 0.2 GNm^{-2} per 1% by weight of reinforcing agent in the composition above the flexural modulus of the unreinforced polyetherketone.

4,360,631

FLOWABLE, ROOM TEMPERATURE VULCANIZABLE SILICONE COMPOSITION

James R. Hahn, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 6, 1981, Ser. No. 241,263

Int. Cl.³ C08L *83/06;* C08K *3/26*

U.S. Cl. 524—788 18 Claims

1. A composition consisting essentially of the product obtained by mixing

(A) 100 parts by weight of a hydroxyl endblocked polydiorganosiloxane having a viscosity at 25° C. of from 0.07 to 15 Pa·s and in which the organic groups are selected from the group consisting of methyl, ethyl, vinyl, phenyl, and 3,3,3-trifluoropropyl radicals, in said polydiorganosiloxane no more than 50 percent of the organic groups being phenyl or 3,3,3-trifluoropropyl radicals and no more than 10 percent of the organic groups being vinyl radicals,

(B) 0 to 150 parts by weight of a nonacidic, nonreinforcing filler,

(C) 2 to 20 parts by weight of methylvinyldi-(epsilon-caprolactamo)silane,

(D) 0.25 to 7 parts by weight of an aminoxysilicon compound having from 1 to 100 silicon atoms per molecule and from 3 to 10 aminoxy groups per molecule, said aminoxy group having a general formula —OX in which X is a monovalent amine radical selected from the group consisting of $—NR''_2$ and a heterocyclic amine, R'' is a monovalent hydrocarbon radical, the —OX group being bonded to silicon atoms through an Si—O bond, the remaining valences of the silicon atoms in the aminoxysilicon compound being satisfied by divalent oxygen atoms which link the silicon atoms of the aminoxysilicon compound having two or more silicon atoms per molecule through silicon-oxygen-silicon bonds and by monovalent radicals selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals bonded to the silicon atoms through silicon-carbon bonds and there being an average of at least one monovalent hydrocarbon radical or halogenated hydrocarbon radical per silicon atom, said aminoxysilicon compound being present in an amount which is not greater than the weight of silane (C), to yield a composition which flows under the force of gravity.

4,360,632

KETONE BISULFITES AS REDUCING AGENT FOR FREE RADICAL POLYMERIZATION

Robert K. Pinschmidt, Jr., Allentown, and Finn L. Marten, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 23, 1981, Ser. No. 314,318
Int. Cl.³ C08L 23/02
U.S. Cl. 524—819 12 Claims

1. In a process for producing a latex containing a dispersed polymer therein by polymerizing a reaction mixture containing vinyl monomer, water, stabilizer and a catalyst consisting of oxidizing agent, a reducing agent and a transition metal salt, the improvement which comprises

using a water-soluble ketone bisulfite as a component of said reducing agent, said ketone having from 3 to 8 carbon atoms in the structure and said ketone bisulfite being present in an amount greater than 75% by weight of said reducing agent.

4,360,633

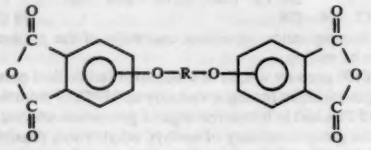
COATING SOLUTION OF POLYETHERIMIDE OLIGOMERS

Donald A. Bolon, and Thomas B. Gorczyca, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,340
Int. Cl.³ C08L 79/08
U.S. Cl. 524—845 9 Claims

1. A coating solution including oligomeric polyetherimides formed by:

(a) reacting at least one aromatic bis(ether anhydride) of the formula:



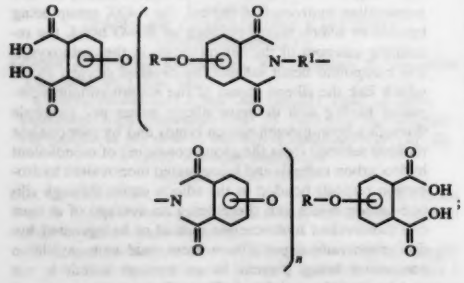
with less than a stoichometric amount of at least one diamine of the general formula:

$$H_2N—R^1—NH_2$$

in a suitable solvent to form oligomeric polyetheramic acids containing terminal anhydride groups;

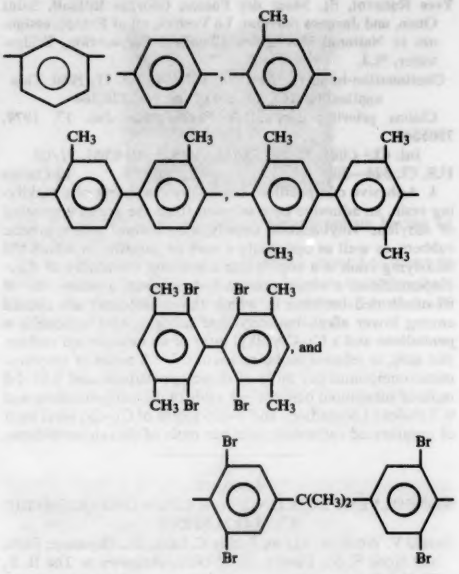
(b) heating the solution of (a) to a temperature between 80° C. and 250° C. to form oligomeric polyetherimide anhydrides;

(c) hydrolizing the oligomeric anhydrides of (b) to form the free acids of the formula:

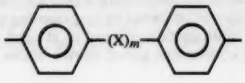


(d) adding to the oligomer solution of (c) more of the same or different diamine, and optionally more solvent and water,

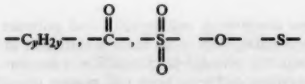
where R is a member selected from the class consisting of (A) divalent organic radicals having the following formulas:



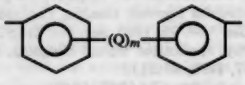
and (B) divalent organic radicals of the general formula:



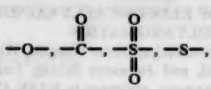
where m is 0 or 1 and X is a member selected from the class consisting of divalent radicals of the formulas,



where y is an integer from 1 to 4; R^1 is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and haloginated derivatives thereof, (b) alkylene radicals having from 2 to about 20 carbon atoms, and cycloalkylene radicals having from 3 to about 30 carbon atoms, (c) from C_2 to about C_8 alkylene terminated polydiorganosiloxane, and (d) divalent radicals of the general formula:



where m is as previously defined and Q is a member selected from the class consisting of



where x is an integer from 1 to 5 inclusive; and n is an integer from 0 to 100.

4,360,634

POLYESTER RESINS CONTAINING DIENE OLIGOMERS

Donald L. Nelson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 8, 1981, Ser. No. 299,702
Int. Cl.³ C08G *63/76*
U.S. Cl. 525—36 **11 Claims**

1. The resin produced by reacting

(A) an alpha, beta ethylenically unsaturated dicarboxylic anhydride containing 0–40 mole percent of saturated or unsaturated polybasic acids or anhydrides which are other than said anhydride,

(B) about 0.2 to about 3.0 moles of water per mole of unsaturated anhydride,

(C) about 0.1 to about 1.2 moles of diene oligomer per mole of unsaturated anhydride, and

(D) about 0.4 to about 1.3 moles of a polyol, or an alkylene oxide, or mixtures thereof per mole of unsaturated anhydride.

4,360,635

THERMOPLASTIC MOULDING COMPOSITIONS OF CELLULOSE ESTER GRAFT COPOLYMERS OR MIXTURES THEREOF WITH CELLULOSE ESTERS

Heinrich Alberts; Winfried Fischer, both of Cologne; Christian Leuschke, Dormagen, and Herbert Bartl, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 215,939
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951748; Dec. 21, 1979, 2951800
Int. Cl.³ C08L *51/00*; C08F *291/06*
U.S. Cl. 525—54.45 **7 Claims**

1. Thermoplastic moulding compositions consisting essentially of:

(1) from 1 to 99%, by weight, of a graft base consisting of:

(a) from 1 to 99%, by weight, of an ethylene/vinyl ester copolymer containing from 5 to 75%, by weight, of incorporated vinyl ester; and

(b) from 99 to 1%, by weight, of a cellulose ester of one or more aliphatic C_1–C_5 carboxylic acids; and graft polymerized units of:

(2) from 99 to 1%, by weight, of one or more vinyl esters and/or alkyl esters of acrylic and/or methacrylic acid; and

(3) from 0 to 20%, by weight, of one or more C_2–C_4 α-olefins; at least part of the ethylene/vinyl ester copolymer and the cellulose ester being bridged with one another through polymerized units of the graft monomers and the sums of components (1) to (3) and (a) and (b) amounting each to 100%, by weight.

4,360,636

BLENDS OF A SULFONE POLYMER AND IMPACT RESISTANT INTERPOLYMER

Joseph Silberberg, Brooklyn, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 27, 1981, Ser. No. 287,389
Int. Cl.³ C08L *51/00, 81/06*
U.S. Cl. 525—64 **7 Claims**

1. A blend comprising: (1) a sulfone polymer and (2) an impact improving amount of an impact resistant interpolymer comprising as the polymeric components crosslinked (meth)acrylate as the first stage, crosslinked styrene-acrylonitrile as the second stage, and uncrosslinked styrene-acrylonitrile as the third stage.

4,360,637

ENGINEERING THERMOPLASTIC OF A DIOL BIS(ALLYL CARBONATE) AND A COPOLYMER OF AN ACRYLATE OF A CYCLOALKYL DIENE

Richard A. Schwarz, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 14, 1981, Ser. No. 330,425
Int. Cl.³ C08F *263/00*
U.S. Cl. 525—277 **16 Claims**

1. A polymerizate of

(1) a diol bis(allyl carbonate); and

(2) a copolymer of

(a) a first monomer having the Formula $R_4R_5C{=}CR_6R_7$, and chosen from the group consisting of:

(i) R_4, R_5, and R_6 being —H, and R_7 being chosen from the group consisting of —H, —CH_3, —Cl, —C_6H_5, —O—CO—CH_3, —O—CH_2CH_3, —O—CH_3, —CO—OH, —CO—O—CH_3, —CO—O—CH_2CH_3, and —CO—NH_2;

(ii) R_4 and R_5 being —H, and R_6 and R_7 being —Cl;

(iii) R_4 and R_5 being —H; R_6 being —CH_3, and R_7 being chosen from the group consisting of —CO—OH, —CO—O—CH_3, and —CO—O—CH_2CH_3; and

(b) an acrylate of a cycloalkyldiene.

4,360,638

PRESSURE SENSITIVE HOT MELT ADHESIVE

Benjamin Bartman, Maple Glen, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 13, 1982, Ser. No. 339,202
Int. Cl.³ C08K *5/09*
U.S. Cl. 524—286 **14 Claims**

1. A composition comprising

(a) an organic polymer containing at least one carboxylic acid group per polymer molecule,

(b) a miscible metal salt in a ratio of at least 10^{-3} moles of metal salt to moles of polymer carboxylic acid,

(c) 10^{-2} to 20% by weight, based on organic polymer, of an o-methoxy aryl acid.

4,360,639

POLY-2-ISOPROPENYLNAPHTHALENE POLY-BUTADIENE-1,3-BLOCK COPOLYMERS AND METHOD FOR THEIR PRODUCTION

Rolf C. Schulz, Mainz, and Dieter Engel, Kelsterbach, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,093
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045807
Int. Cl.³ C08F *297/04*
U.S. Cl. 525—289 **10 Claims**

1. Block copolymer composed of poly-2-isopropenylnaphthalene and poly-butadiene-1,3, with a molecular weight of at least 10,000.

4,360,640

ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE STYRENE ALLYL ALCOHOL COPOLYMERS

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,588
Int. Cl.³ C08L *51/00*
U.S. Cl. 525—301 **5 Claims**

1. A water dispersible graft copolymer of an acrylic monomer or monomers and a random copolymer of a styrene and

between about 20 weight percent and 30 weight percent of the random copolymer of allyl alcohol, in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both.

4,360,641

ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE STYRENE HYDROXYETHYL (METH)ACRYLATE COPOLYMERS

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,590
Int. Cl.³ C08L *51/00*
U.S. Cl. 525—301 **3 Claims**

1. A graft copolymer of an acrylic monomer or monomers or of acrylic monomer or monomers and other monomers copolymerizable therewith ion a backbone comprising a random copolymer of a styrene and between about 20 weight percent and about 30 weight percent of the random copolymer of hydroxyethyl (meth)acrylate, in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both.

4,360,642

ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE STYRENE (METH)ACRYLONITRILE COPOLYMERS

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 18, 1981, Ser. No. 275,000
Int. Cl.³ C08L *51/00*
U.S. Cl. 525—301 **4 Claims**

1. A graft copolymer of an acrylic monomer or monomers or of acrylic monomer or monomers and other monomers copolymerization therewith and a random copolymer of a styrene and between about 20 weight percent and about 30 weight percent of the random copolymer of (meth)acrylonitrile, in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both.

4,360,643

METHOD OF PREPARING LACTONE BLOCK COPOLYMERS

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 27,124, Apr. 4, 1979, abandoned. This application Jul. 16, 1980, Ser. No. 169,346
Int. Cl.³ C08F *6/02*
U.S. Cl. 525—386 **14 Claims**

1. A method of preparing a lactone copolymer which comprises the steps of:

(a) providing a lithium-terminated polymer of the form $A—D—Li)_y$ wherein A is a polymer segment comprising one or more polymer blocks of one or more conjugated dienes and/or monovinylarenes, D is a polymer segment comprising one or more polymer blocks of one or more lactones, and y is 1, 2, 3 or 4, the lithium-terminated polymer being present in a diluent selected from the group consisting of paraffins, cycloparaffins and aromatic hydrocarbons;

(b) contacting the lithium-terminated polymer with water to form (1) a lactone copolymer of the form $A—D)_y$ which is present in an organic phase comprising the lactone copolymer $A—D)_y$ and the diluent and (2) a water-soluble lithium hydroxide termination product which is present in a separate phase from the organic phase, the separate phase comprising water and lithium hydroxide; and

(c) recovering the lactone copolymer of the form $A—D)_y$.

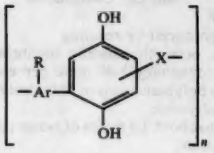
4,360,644

PREPARATION OF ELECTRICALLY CONDUCTIVE POLYAROMATICS

Herbert Naarmann, Wattenheim; Dieter Naegele, Worms; Klaus Penzien, Frankenthal, and Johannes Schlag, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 31, 1980, Ser. No. 221,731
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1980, 3000379
Int. Cl.³ C08G *61/10*; C08L *3/00*
U.S. Cl. 525—390 **4 Claims**

1. A process for the preparation of an electrically conductive polyaromatic having an electrical conductivity greater than 10^{-2} Siemens/cm, said polyaromatic having the formula



where X is

Ar is phenylene, R is H or an aliphatic, cycloaliphatic or aromatic group, and n is an integer from 1 to 50 said process consisting essentially of treating said polyaromatic in the absence of moisture with 0.5 to 15% by weight, based on the polyaromatic, of an oxidizing Lewis acid.

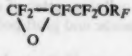
4,360,645

PERFLUOROGLYCIDYL ETHERS

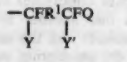
Carl G. Krespan, and Alicia P. King, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1981, Ser. No. 250,906
Int. Cl.³ C08G *65/22, 65/32*
U.S. Cl. 525—403 **7 Claims**

1. A homopolymer of a perfluoroglycidyl ether of the formula

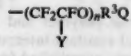


wherein R_F is:



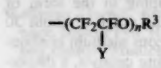
(i)

wherein R^1 is a carbon-carbon bond or a linear or branched perfluoroalkylene group of 1 to 12 carbon atoms; Q is $—SO_2F$, —COF, —F, —Cl, —Br, —I, —CN, $—CO_2H$, $—OC_6F_5$, or $—CO_2R^4$ where R^4 is $—CH_3$ or $—C_2H_5$; Y and Y′ are —F or $—CF_3$, provided that only one of Y and Y′ can be $—CF_3$; or (ii) $—CF(R^2)_2$ wherein R^2 is —F, $—CF_2Cl$, $—CF_2CN$, $—CF_2COF$, $—CF_2CO_2H$, $—CF_2OCF(CF_3)_2$ or $—CF_2CO_2R^4$ where R^4 is defined as above;



(iii)

wherein R^3 is a linear or branched perfluoroalkylene group of carbon content such that the moiety



does not exceed 15 carbon atoms; Y independently is —F or $—CF_3$; n is 1 to 4; and Q is as defined above; or (iv) $—C_6F_5$.

4,360,646

PREPARATION OF LYSINE BASED MACROMOLECULAR HIGHLY BRANCHED HOMOGENEOUS COMPOUND

Robert G. Denkewalter, Westfield; Jaroslav Kolc, Randolph Township, Morris County, and William J. Lukasavage, Harrison, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 27,622, Apr. 6, 1979, Pat. No. 4,289,872. This application Apr. 29, 1981, Ser. No. 258,707

Int. Cl.[3] C08G *69/10*

U.S. Cl. 525—420 3 Claims

1. Process of producing a macromolecule which comprises:

(A) an initiation stage wherein at least one source unit(S) is combined with at least one lysine unit by:

(1) blocking the two amino groups of lysine by conversion of each to a t-butyloxyurethane group; thus protecting these amino groups against reaction with the carboxyl group;

(2) blocking the free carboxyl group of the obtained diurethane, N,N′-(di(t-butyloxycarbonyl) lysine, by conversion thereof to an inert N-substituted amide of said carboxyl group, inert toward amino groups;

(3) liberating the two lysine amino groups by hydrolysis of the two urethane groups whereby the t-butyloxycarbonyl groups are removed and decomposed to t-butanol and carbon dioxide; thus freeing the two amino groups and obtaining a Compound I;

(B) a first growth stage wherein two lysine units (M) are linked to the lysine unit of Compound I by:

(1) blocking the two amino groups of the lysine unit in Compound I as in step (A) (1) above by conversion of each to a t-butyloxy urethane group;

(2) forming a Compound (II) by converting the free carboxyl group of the N,N′-di(t-butyloxycarbonyl) lysine, obtained in step (B) (1) above, to a carboxyl derivative reactive with amino groups;

(3) contacting the diamino-containing Compound (I), obtained in step (A)(3) above, with the reactive carboxyl derivative, Compound (II) of step (B)(2) above, to form the linkage —CONH— and thereby link the lysine unit (M) of Compound I via its two amino groups to each of two diurethane lysine units (M) of Compound II via their carboxyl groups; and then liberating the four blocked amino groups by hydrolysis of the four urethane groups as in step (A)(3) above thereby forming Compound III;

(C) as a third stage, repeating the steps, as in the preceding stage, of blocking the lysine amino groups; coverting the carboxyls of such blocked lysines to a reactive derivative Compound II; and linking four of these Compound II molecules via their reactive carboxyl derivative, to the four amino groups in each molecule of Compound III; and then liberating the eight amino groups of the four newly added lysine units to form Compound IV;

(D) repeating at least once more, the set of growth steps of stage (C) above, thereby at each new stage increasing by a factor of essentially 2, the number of lysine units contained in the resulting macromolecule.

3. Process of claim 1 wherein, as an additional stage, the macromolecule of lysine units is modified by reacting at least some of the free amino groups of a lysine unit with a reactive carboxyl derivative of at least one amino acid different from lysine, or with bromoacetic acid.

4,360,647

PHOSPHONATE TERMINATED DICYCLOPENTADIENE MODIFIED POLYESTERS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1981, Ser. No. 283,316

Int. Cl.[3] C08F *283/02;* C08G *63/68, 63/54*

U.S. Cl. 525—445 24 Claims

1. A curable unsaturated polyester resin of an α,β-unsaturated polycarboxylic acid, anhydride or mixture thereof and a polyol or mixture of polyols, said polyester having pendant unsaturation and having at least one end terminated by an alkoxyalkyl phosphonate.

4,360,648

PROCESS FOR THE PREPARATION OF POLYESTERS AND POLY(ESTER-CARBONATES)

Winston J. Jackson, Jr., Kingsport, Tenn., and William R. Darnell, Weber City, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,811

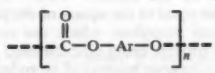
Int. Cl.[3] C08G *63/64;* C08L *69/00*

U.S. Cl. 525—462 8 Claims

1. Process for preparing polyesters and poly(ester-carbonates) comprising

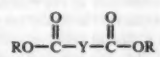
(a) preparing a reaction mixture of

(1) an aromatic polycarbonate having an inherent viscosity of about 0.1 or more and (A) having the general formula



wherein Ar is the residue remaining after the removal of the hydroxy groups from at least one aromatic diol and optionally the residue may be substituted with alkyl groups containing 1–4 carbon atoms or phenyl,

(2) an ester of a dicarboxylic acid (B) having the general formula



wherein R may be the same or different and is selected from aliphatic, cycloaliphatic and aryl groups containing up to 8 carbon atoms, and Y is the residue remaining after removal of the carboxyl groups from an aliphatic, cycloaliphatic or armatic dicarboxylic acid, and

(3) a catalytic amount of a suitable ester exchange and polymerization catalyst,

(b) initially heating said reaction mixture sufficiently to substantially reduce the melt viscosity of the reaction mixture,

(c) increasing the temperature as required to keep the reaction mixture molten and to distill away the dialkyl or diaryl carbonate condensation by-product, and

(d) reducing pressure to further remove said by-product and to increase the molecular weight of the polymer product.

4,360,649
CURABLE COMPOSITION

Kunimasa Kamio, Toyonaka; Koichi Okuno, Izumiotsu; Satoru Haraguchi, Minoo; Hiroyuki Yamaguchi, Toyonaka, and Koichi Ohashi, Higashiosaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

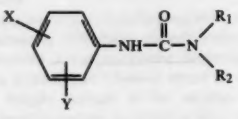
Filed Apr. 15, 1981, Ser. No. 254,277

Claims priority, application Japan, Apr. 30, 1980, 55-58479; Dec. 12, 1980, 55-176150

Int. Cl.³ C08G *59/64*

U.S. Cl. 525—484 **9 Claims**

1. A curable resin composition comprising an epoxy resin, a hardener, an epoxy compound-dialkyl-amine adduct as a latent hardener and a urea compound of the formula:



wherein X and Y are each hydrogen, chlorine, bromine, methyl, nitro or methoxy, and R_1 and R_2 are each alkyl, alkenyl, aryl or aralkyl, or, taken together, may form a ring.

4,360,650
PROCESS FOR THE PRODUCTION OF COPOLYMERS OF PROPYLENE AND BUT-1-ENE, PRODUCTS RESULTING THEREFROM AND USES THEREOF

Bernard Desvignes; Jean C. Bailly, and Pierre Mangin, all of Martigues, France, assignors to Naphtachimie Societe Anonyme, Courbevoir, France

Filed Jul. 28, 1980, Ser. No. 173,116

Claims priority, application France, Jul. 30, 1979, 79 19520

Int. Cl.³ C08F *2/34*

U.S. Cl. 526—60 **9 Claims**

1. A process for the production of copolymers of propylene and but-1-ene, wherein the proportion by weight of units derived from but-1-ene is from 10 to 40% and wherein the proportion, denoted by the symbol "PRE" of isolated ethyl branches is at least equal to the square of the proportion (P) of units derived from propylene which are contained in said copolymers, said process being characterized as a continuous process in which a gaseous mixture of propylene and but-1-ene is introduced into a fluidization vessel for admixture in a dry fluidized state with a catalytic system which is stereospecific in the polymerization of propylene alone and consists essentially of a solid titanium trichloride and one or more organo-metallic compounds of the metals of groups II and III of the periodic table of elements, continuously withdrawing unreacted monomers and solid polymer particles from the reaction vessel, separating unreacted monomers from the remainder, recycling separated unreacted monomer to the reaction vessel, and adding monomer for introduction with the recycle gaseous monomer in an amount to maintain relatively constant the ratio of monomers introduced into the reaction vessel for polymerization, and maintaining the fluidized materials in the reaction vessel under pressure of less than 40 bars during the polymerization reaction.

4,360,651
PROCESS FOR PREPARING SPHERICAL AND POROUS VINYL RESIN PARTICLES

Kornelius Dinbergs, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 258,854, Apr. 29, 1981, abandoned, which is a continuation of Ser. No. 150,841, May 19, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 299,741

Int. Cl.³ C08F *2/20*

U.S. Cl. 526—88 **24 Claims**

1. A process for producing spherical particles of polymer having a high porosity which comprises polymerizing in an aqueous medium, in a reaction vessel having an agitator positioned therein, one or more ethylenically unsaturated monomers having a terminal $CH_2{=}C<$ grouping in the form of discrete particles having a diameter in the range of about 30 microns to about 1000 microns, said aqueous medium containing a monomer-soluble free radical yielding catalyst, a dispersant comprising a substantially unneutralized, water-insoluble, crosslinked polymer of one or more carboxylic acid monomers with a polyunsaturated crosslinking monomer having a plurality of terminally unsaturated polymerizable groups and a water-soluble nonionic surfactant selected from the group consisting of polyoxyethylene alkylphenols, polyoxyethylene alcohols, polyoxyethylene esters of fatty acids, polyoxyethlene alkylamines, and polyoxyethylene alkylamides, conducting the polymerization at a temperature in the range of about 0° C. to about 150° C. with vigorous agitation in said aqueous medium throughout the entire polymerization reaction, said agitator being operated at an rpm in the range of about 10 rpm to about 275 rpm with a blade tip speed in the range of about 2 ft./sec. to about 65 ft./sec. using a reactor having a capacity of about 30 gallon to 40,000 gallons, and wherein polymer buildup on the surfaces of said reaction vessel is substantially reduced.

4,360,652
METHOD OF PREPARING HIGH QUALITY VINYLIDENE FLUORIDE POLYMER IN AQUEOUS EMULSION

Julius E. Dohany, Tredyffrin, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 31, 1981, Ser. No. 297,582

Int. Cl.³ C08K *5/05*

U.S. Cl. 526—210 **9 Claims**

1. In a process for preparing high molecular weight vinylidene fluoride polymer by emulsion polymerization of monomer in a stirred aqueous reaction medium containing a fluoroalkyl surfactant emulsifier, the improvement which comprises using diisopropyl peroxydicarbonate as the polymerization initiator and isopropyl alcohol as the chain transfer agent and wherein monomer, initiator and chain transfer agent are added separately but simultaneously to the system, incrementally or continuously over the polymerization cycle, the initiator being added as the emulsified component of an aqueous emulsion in which a fluorosurfactant, readily soluble in cold water and capable of emulsifying the initiator for the duration of the polymerization is used.

4,360,653
POLYMERIZATE OF (ALLYL CARBONATE) AND ALIPHATIC POLYURETHANE HAVING ACRYLIC UNSATURATION

Henry C. Stevens, Akron; Edward J. Sare, Clinton, and Mark S. Holtman, Macedonia, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

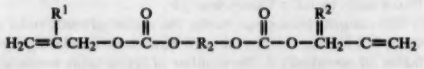
Filed Oct. 23, 1981, Ser. No. 314,267

Int. Cl.³ C08F *26/02;* C08L *75/04, 75/08*

U.S. Cl. 526—301 **24 Claims**

1. A copolymer of

(A) an aliphatic diol bis(allyl carbonate) having the formula



where R^1 and R^2 are independently chosen from the groups consisting of hydrogen, Cl, F, Br, and C_1 to C_4 alkyl groups, and R_2 is chosen from the group consisting of alkylene groups, alkylene ether groups, alkylene polyether groups, and alkylene carbonate groups; and

(B) a polyurethane having terminal acrylate functionality.

4,360,654

REACTION PRODUCTS OF SILICIC ACID ESTERS AND ORGANIC TIN COMPOUNDS

Wolfgang Hechtl, Burghausen, and Arnold Garhammer, Simbach, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 25, 1981, Ser. No. 295,961

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039720

Int. Cl.³ C08G 77/06

U.S. Cl. 528—18 4 Claims

1. An organopolysiloxane composition capable of forming an elastomer comprising a hydroxyl terminated diorganopolysiloxane and (1) a product obtained from the reaction of (a) silicic acid ester and an (b) an organic tin compound of the formula

$$R_2Sn(OCOR^1)_2 \quad (I),$$

wherein R is selected from the group consisting of a butyl and an octyl radical, R^1 is a monovalent hydrocarbon radical having from 1 to 15 carbon atoms, in which no more than one of the valences of the carbon atom bonded to the carboxyl group is saturated by a carbon atom other than that of the carboxyl group and (2) an organic tin compound of the formula

$$R_2Sn(OCOR^2)_2 \quad (II),$$

wherein R is selected from the group consisting of a butyl and an octyl radical, R^2 is a monovalent aliphatic hydrocarbon radical having from 3 to 15 carbon atoms, in which at least two of the valences of the carbon atom which is bonded to the carboxyl group are saturated by at least two carbon atoms other than that of the carboxyl group.

4,360,655

HEAT-CURABLE MIXTURES, WHICH ARE STABLE ON STORAGE, OF EPOXIDE COMPOUNDS β-AMINOCROTONIC ACID DERIVATIVES AND POLYAMINE

Theobald Haug, Frenkendorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

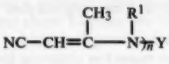
Division of Ser. No. 89,014, Oct. 29, 1979, Pat. No. 4,291,146. This application Jun. 1, 1981, Ser. No. 268,922

Claims priority, application Switzerland, Aug. 11, 1978, 11480/78

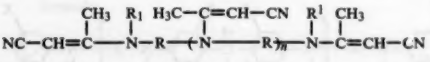
Int. Cl.³ C08G 59/52

U.S. Cl. 528—120 6 Claims

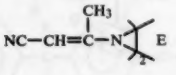
1. A heat-curable mixture which is stable on storage, which contains (a) an epoxide compound with, on average, more than one epoxide group in the molecule, (b) a β-aminocrotonic acid derivative of the formula I to X



(I)



(II)



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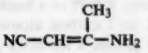

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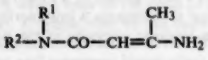

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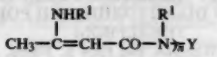

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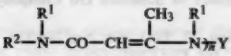

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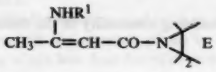
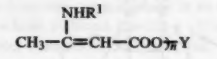
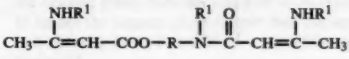


(VIII)



(IX)

or

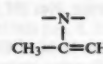


(X)

in which R^1 and R^2 independently of one another are each a hydrogen atom, alkyl having 1 to 6 C atoms, cycloalkyl having 5 or 6 C atoms or aryl having 6 to 10 C atoms, Y is a n-valent organic radical having 2 to 30 C atoms, R is an aromatic or aliphatic radical having not more than 30 C atoms, E, together with the two N atoms, is a heterocyclic, five-membered or six-membered ring and n is a number from 1 to 3, and (c) a polyamine of the formula XI

$$G-(NH_2)_y \quad (XI)$$

in which the radical G is a y-valent organic radical having 2 to 40 C atoms and y is a number from 2 to 4; the curable mixture containing 2 to 8 epoxide equivalents per 1 equivalent of β-aminocrotonic acid derivative, containing the grouping



and a maximum of 70% of amino group equivalents, based on the sum of the equivalents of β-aminocrotonic acid derivative and amino group.

4,360,656

ALTERNATING COPOLYESTERCARBONATE RESINS

Daniel J. Swart, and Jacqueline S. Kelyman, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

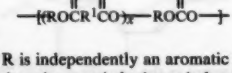
Continuation-in-part of Ser. No. 166,283, Jul. 7, 1980, Pat. No. 4,278,787, which is a continuation-in-part of Ser. No. 916,616, Jun. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 795,978, May 11, 1977, Pat. No. 4,105,633. This application Sep. 22, 1980, Ser. No. 189,235

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.³ C08G 63/64

U.S. Cl. 528—176 4 Claims

1. A normally solid alternating copolyestercarbonate having repeating units of the formula:



wherein each R is independently an aromatic hydrocarbylene or inertly substituted aromatic hydrocarbylene, R^1 is para-phenylene or inertly substituted para-phenylene and x is a number from 0.05 to 0.52.

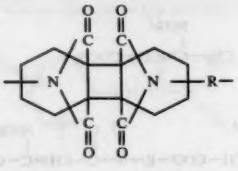
4,360,657

TRICYCLO[6.4.0.0^{2,7}]-DODECANE-1,8,2,7-TETRACARBOXYLIC ACID DIANHYDRIDE AND POLYIMIDES THEREFROM

Tayseer S. Nimry, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 19, 1981, Ser. No. 294,322
Int. Cl.^{3} C08G *73/10*
U.S. Cl. 528—188 52 Claims

1. A polyimide consisting essentially of the following recurring structure:



wherein R is a divalent aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon radical.

4,360,658

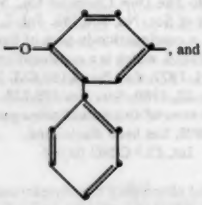
COPOLYESTER DERIVED FROM TEREPHTHALIC ACID, PHENYLHYDROQUINONE AND HYDROQUINONE

Winston J. Jackson, Jr., and Herbert F. Kuhfuss, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 95,279, Nov. 19, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 237,173
Int. Cl.^{3} C08G *63/18*
U.S. Cl. 528—193 4 Claims

1. Copolyester having a film- and fiber-forming molecular weight consisting essentially of the following divalent radicals

A.



B.

, and

C.

wherein (B) is present in the amount of 50 to 75 mole percent and (C) is present in the amount of 25 to 50 mole percent based on total moles of (B) and (C).

4,360,659

NON-CATALYZED INTERFACIAL POLYCONDENSATION POLYCARBONATE PROCESS

Subhas K. Sikdar, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 6, 1981, Ser. No. 260,874
Int. Cl.^{3} C08G *63/62*
U.S. Cl. 528—196 10 Claims

1. An improved interfacial polycondensation polycarbonate process wherein at least one dihydric phenol is reacted with a carbonyl halide the improvement comprising performing the process in the absence of a polycondensation catalyst and in accordance with the following process sequence and parameters:

(1) forming an equilibrated substantially uniform agitated two-phase admixture containing

(i) an organic phase containing an inert solvent,

(ii) an aqueous phase containing dissolved therein an aromatic dihydroxy compound, a strong base, and having a pH of at least about 11, subject to the proviso that,

(a) the volume ratio of inert organic solvent phase to aqueous phase is within the range of from 0.04:1 to 0.20:1, and

(b) the mol ratio of base to aromatic dihydroxy compound is at least about 0.25:1,

(2) adding and reacting a carbonyl halide with the aromatic dihydroxy compound to form an aromatic polycarbonate having a M_w of at least about 2000 as determined by gel permeation chromatography and an M_w/M_n of less than about 6.0,

and

(3) separating and recovering the solid aromatic polycarbonate particulate from the liquid aqueous phase.

4,360,660

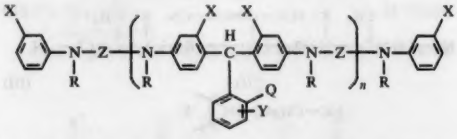
TRIPHENYLMETHANE POLYMER, PROCESS FOR PRODUCTION THEREOF, AND PHOTOCONDUCTIVE COMPOSITIONS AND MEMBERS FORMED THEREFROM

Shu Watarai; Kazuo Ishii, and Takeshi Takayama, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1980, Ser. No. 218,227
Claims priority, application Japan, Dec. 22, 1979, 54-166306; May 16, 1980, 55-65052
Int. Cl.^{3} C08G *12/08*
U.S. Cl. 528—266 16 Claims

1. A triphenylmethane polymer represented by formula (I)

(I)



wherein R is an alkyl group, X is H or a methyl group, Z is an alkylene group having 1 to 5 carbon atoms or a p-xylylene group, Y is H, a methyl group, a methoxy group, a tertiary amino group, halogen, a nitro group, or a cyano group, Q is H or a methyl group, and n represents a polymerization degree sufficient to obtain an intrinsic viscosity of the polymer from 0.005 to 1.000.

4,360,661

PROCESS FOR THE REGENERATION AND FURTHER PROCESSING OF INACTIVE, LINEAR POLYALKYLENE TEREPHTHALATES

Gernot Horlbeck; Horst Heuer, both of Haltern; Hanns-Jörg Bax, and Hans Jadamus, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 219,041

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951612; Sep. 5, 1980, 3033469

Int. Cl.³ C08G *63/26*

U.S. Cl. 528—272 10 Claims

1. A process for the regeneration and further condensation of a linear polyalkylene terephthalate which is inactive after recondensation and which has a viscosity number of at least 60 cc/g as measured in a solution of 0.23 g of polyalkylene terephthalate in 100 ml of phenol/1,1,2,2-tetrachloroethane (weight ratio 60:40) at 25° C., the process being conducted in the solid phase, in two stages and at an elevated temperature, in the presence of an alkanediol, and comprising, in a first stage, treating the inactive polyalkylene terephthalate at a reaction temperature of 30°–80° C. below its melting point, with 0.3–3.5% by weight, based on the weight of the polyalkylene terephthalate, of an alkanediol whose boiling point under normal pressure is 20°–70° C. above the reaction temperature, in an inert gas stream, wherein the amount of inert gas passed through per hour, measured under standard conditions, corresponds to 0.3–2 times the gross reactor volume and wherein the first stage is conducted until the polyalkylene terephthalate has achieved essentially its minimum carboxy end group concentration; and in a second stage, condensing the polyalkylene terephthalate at a temperature of 5°–25° C. below its melting point in an inert gas stream, wherein the amount of inert gas passed through per hour, measured under standard conditions, corresponds to 2.5–10 times the gross reactor volume.

4,360,662

CONTINUOUS COUNTERCURRENT EXTRACTION PROCESS FOR REMOVING WATER-SOLUBLE IMPURITIES FROM WATER IMMISCIBLE POLYMER SOLUTIONS

Albert G. Williams, West Orange, N.J., assignor to Celanese Corporation, New York, N.Y.

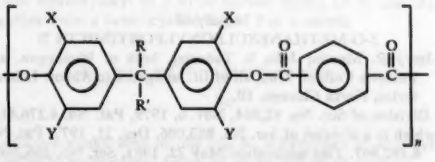
Filed Nov. 19, 1980, Ser. No. 208,201

Int. Cl.³ C08G *63/70, 63/74*

U.S. Cl. 528—499 20 Claims

1. A continuous countercurrent extraction process for removing a tertiary amine hydrochloride from a water immiscible solution of a halogenated aromatic polyester, said tertiary amine hydrochloride being dissolved in said water immiscible solution in an amount of greater than about 0.5% by weight, which comprises:

(a) introducing a water immiscible solution, having a viscosity of at least about 10 poise and not greater than about 300 poise and a density of greater than about 1.0 gm/cc., of a halogenated aromatic polyester of the recurring structural formula:



where X which may be the same or different is chlorine or bromine, Y which may be the same or different is hydrogen, chlorine or bromine, R and R' may be the same or different and represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, and n=at least 10, at the top of an extraction column and introducing water at the bottom of said column to form a twophase mixture comprising an organic phase and an aqueous phase with each pahse flowing in counter current directions;

(b) controlling the volume ratio of the flow rates of the organic phase to aqueous phase to be from about 2:1 to about 10:1;

(c) mechanically agitating said mixture in a manner sufficient to (1) permit the aqueous phase to travel at an upward velocity of not less than the relative downward velocity of organic phase and (2) extract said tertiary amine hydrochloride from the organic phase in an amount sufficient to yield a whole raffinate having a chloride ion content of not greater than about 500 ppm; and

(d) maintaining the two phases during extraction at a temperature sufficiently low so that the polymer solvent of the organic phase does not vaporize to an extent sufficient to render the organic phase lighter than the aqueous phase and thereby have it travel in a direction concurrently therewith.

4,360,663

STEROID HORMONE-ANTITUMOR DERIVATIVES

Kiro Asano; Humio Tamura, both of Kukizaki; Hiromitsu Tanaka, Tokyo, and Satoru Enomoto, Fujisawa, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

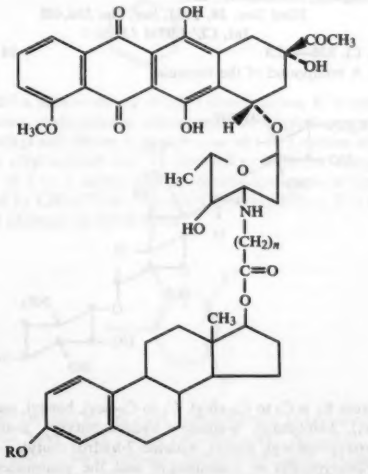
Division of Ser. No. 62,819, Aug. 1, 1979, Pat. No. 4,260,736. This application Dec. 2, 1980, Ser. No. 212,117

Claims priority, application Japan, Aug. 14, 1978, 53-98796; Aug. 14, 1978, 53-98797; Aug. 14, 1978, 53-98798; Aug. 14, 1978, 53-98799; Sep. 4, 1978, 53-108290; Dec. 8, 1978, 53-152176; Dec. 14, 1978, 53-154842; May 29, 1979, 54-66496

Int. Cl.³ C07J *17/00, 3/00*

U.S. Cl. 536—5 5 Claims

1. A compound of the formula:



wherein R is hydrogen or acyl and n is an integer of 1 to 3.

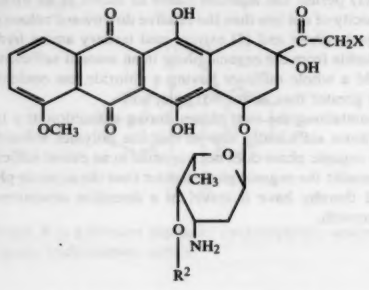
4,360,664

ANTHRACYCLINE GLYCOSIDE 14-HALO,4'-ETHER

Hamao Umezawa; Tomio Takeuchi; Hiroshi Naganawa, and Kuniaki Tatsuta, all of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Apr. 13, 1981, Ser. No. 253,489
Claims priority, application Japan, Apr. 26, 1980, 55-55974
Int. Cl.³ C07H *15/24*
U.S. Cl. 536—6.4 3 Claims

1. A compound having the formula



IV

wherein X is bromine or iodine and R^2 is tetrahydropyranyl, 6-acetoxymethyltetrahydropyranyl, 6-methoxytetrahydropyranyl, 6-carbomethoxytetrahydropyranyl, tetrahydrofuranyl, C_1–C_8 alkyloxyethyl or cyclohexyloxyethyl, or an acid addition salt thereof.

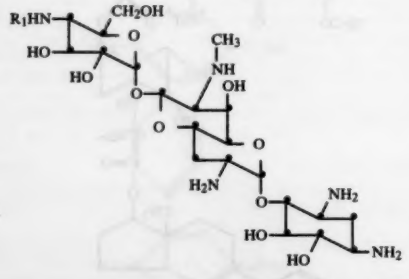
4,360,665

4''-N-(SUBSTITUTED)-APRAMYCIN ANTIBIOTIC DERIVATIVES AND INTERMEDIATES THEREFOR

Herbert A. Kirst, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 24, 1981, Ser. No. 334,408
Int. Cl.³ C07H *15/22*
U.S. Cl. 536—16.8 14 Claims

1. A compound of the formula



wherein R_1 is C_2 to C_4-alkyl, C_1 to C_4-acyl, benzyl, methoxybenzyl, halobenzyl, γ-amino-α-hydroxybutyryl, β-amino-α-hydroxypropionyl, glycyl, 4-amino-2-hydroxybutyl, 3-amino-2-hydroxypropyl or 2-aminoetyl; and the pharmaceutically acceptable acid addition salts thereof.

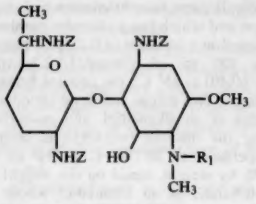
4,360,666

2-DEOXYFORTIMICIN A, 4-N-ALKYL AND 4-N-ACYL-2-DEOXYFORTIMICIN B DERIVATIVES AND INTERMEDIATES THEREFOR

John S. Tadanier; Jerry R. Martin, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 91,864, Nov. 6, 1979, Pat. No. 4,276,413, which is a division of Ser. No. 863,006, Dec. 21, 1977, Pat. No. 4,192,867. This application May 22, 1981, Ser. No. 266,030
Int. Cl.³ C07N *15/22*
U.S. Cl. 536—16.1 4 Claims

1. A compound of the formula



wherein: Z is benzyloxycarbonyl and R_1 is selected from the group consisting of hydrogen, acyl or N,N-diloweralkylaminoacyl, hydroxyacyl, loweralkyl, N,N-diloweralkylaminoloweralkyl or a benzyloxycarbonyl-protected amino acid residue, aminoacyl, N-monoloweralkylaminoacyl, hydroxy-substituted aminoacyl, aminoloweralkyl, N-monoloweralkylaminoloweralkyl.

4,360,667

(1,2',6'-TRI-N-(2-O-METHANESULFONYL-SALICYLIDINE)-4,5-(2-O-METHANESULFONYL-SALICYLALDEHYDE) OXAZOLIDINE-2-O-METHANESULFONYLFORTIMICIN B

John S. Tadanier; Jerry R. Martin, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 91,864, Nov. 6, 1979, Pat. No. 4,276,413, which is a division of Ser. No. 863,006, Dec. 21, 1977, Pat. No. 4,192,867. This application May 22, 1981, Ser. No. 266,031
Int. Cl.³ C07H *15/22*; A61K *31/71*
U.S. Cl. 536—16.1 1 Claim

1. The compound 1,2',6'-tri-N-(2-O-methanesulfonylsalicylidine)-4,5-(2-O-methanesulfonylsalicylaldehyde)oxazolidine-2-O-methanesulfonylfortimicin B.

4,360,668

2-O-METHANESULFONYLFORTIMICIN B

Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 91,864, Nov. 6, 1979, Pat. No. 4,276,413, which is a division of Ser. No. 863,006, Dec. 21, 1977, Pat. No. 4,192,867. This application May 22, 1981, Ser. No. 266,266
Int. Cl.³ C07H *15/22*
U.S. Cl. 536—16.1 2 Claims

1. 2-O-methanesulfonylfortimicin B or a pharmaceutically acceptable salt thereof.

4,360,669
PREPARATION OF N-(D)-RIBITYL-2-PHENYLAZO-4,5-DIMETHYLANILINE

Wolfram Schmidt, Friedelsheim; Joachim Paust, Neuhofen, and Axel Nürrenbach, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,601

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030054

Int. Cl.³ C07H *1/00, 1/06*

U.S. Cl. 260—207.5 2 Claims

1. A process for the preparation of N-(D)-ribityl-2-phenylazo-4,5-dimethylaniline from crude ribose, as an industrial mixture of (D)-ribose and other sugars, which process comprises:

(a) reacting the crude ribose, while in aqueous or aqueous-organic solution or while in solution in a water-soluble organic solvent at from 0° to 50° C., with about equimolar amounts, based on (D)-ribose, of 3,4-dimethylaniline and boric acid;

(b) crystallizing the boric acid ester of the Schiff base obtained, which ester was obtained in step (a), and separating the boric acid ester crystals from solution;

(c) dissolving the boric acid ester crystals in aqueous or aqueous-organic solution;

(d) hydrogenating the solution of boric acid ester obtained by step (c) at from 20° to 70° C., under hydrogen, at a pressure of from 10 to 100 bar, in the presence of a hydrogenation catalyst;

(e) separating the solution from the catalyst and reacting the N-(D)-ribityl-3,4-dimethylaniline resulting from step (c) while still in solution in a conventional manner with an acid phenyldiazonium salt solution; and

(f) isolating the resulting product by crystallization in a conventional manner.

4,360,670
AMINO AND AMIDO DIALKYL TIN CARBOXYLATES

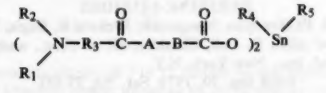
Ibrahim S. Bechara, Boothwyn, and Rocco L. Mascioli, Media, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

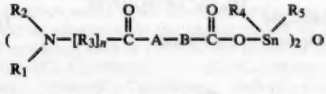
Filed Feb. 2, 1981, Ser. No. 230,849

Int. Cl.³ C07F *7/22;* C07D *207/00*

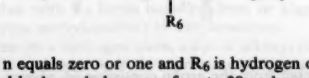
U.S. Cl. 544—64 6 Claims

1. Compounds corresponding to either of the formulae:





wherein R_1 and R_2 are independently H, alkyl of 1 to 20 carbon atoms; hydroxyalkyl of 2 to 20 carbon atoms; or R_1 and R_2 together form a heterocyclic ring of 5 or 6 atoms;



in which n equals zero or one and R_6 is hydrogen or an alkyl or an alkyl hydrocarbyl group of up to 20 carbon atoms;

A and B are carbon atoms linked by a single or double bond or together comprise part of a six membered ring from the group consisting of cyclohexane, cyclohexene and benzene;

R_4 and R_5 are independently alkyl groups of 1 to 20 carbon atoms, phenyl or cycloalkyl groups of 6 to 20 carbon atoms.

4,360,671
PREPARATION OF CYANURIC ACID

John A. Wojtowicz, Cheshire, and Douglas A. Farmer, Jr., Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 5, 1981, Ser. No. 308,635

Int. Cl.³ C07D *251/32*

U.S. Cl. 544—192 23 Claims

1. In a process for making cyanuric acid by pyrolyzing a nitrogenous containing material capable of yielding a cyanuric acid product, said material being dissolved in an inert solvent in a pyrolysis vessel to produce a hot reaction mass comprising a slurry of crude cyanuric acid in said solvent, characterized by the improvement which comprises employing as said solvent a linear alkyl dinitrile of the general formula:

$$N{\equiv}C(CH_2)_nC{\equiv}N$$

wherein n ranges from 1 to 8.

4,360,672
SUBSTITUTED PHENOXYPHENYL PYRIDAZONES, THEIR PREPARATION, AND THEIR USE AS HERBICIDES

Adolf Parg, Bad Durkheim; Gerhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

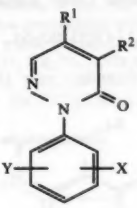
Filed Mar. 26, 1981, Ser. No. 247,784

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013267

Int. Cl.³ C07D *237/22, 237/20, 237/14, 237/16*

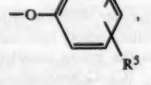
U.S. Cl. 544—240 2 Claims

1. A substituted pyridazone of the formula



I

where R^2 is halo or alkoxy of 1 to 3 carbon atoms, R^1 is amino, alkylamino, dialkylamino, alkoxyamino or alkylalkoxyamino, where alkyl and alkoxy is in each case of 1 to 3 carbon atoms and the alkyl radicals may be identical or different, halogen, alkoxy of 1 to 3 carbon atoms, trimethyleneimino or amino acylated by $ClH_2CC(O)$— or $CH_3COOCH_2C(O)$—, X is substituted phenoxy of the formula



where R^3, R^4 and R^5 are each, independently of one another, hydrogen, halo, nitro, cyano, carboxyl, alkyl, haloalkyl, alkoxy, haloalkoxy, alkylmercapto, haloalkylmercapto, alkylsulfinyl or alkylsulfonyl, alkyl or alkoxy in each case being of 1 to 4 carbon atoms, and Y is hydrogen, halo, haloalkyl, cyano or nitro.

4,360,673

5-PHENYL-1,3-ALKANO-1,2,3,4,4a,9b-HEXAHYDROPYRIDO [4,3-b]INDOLES

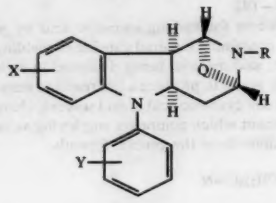
Joel G. Berger, Verona, and Pirouz Tahbaz, Cedar Grove, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Mar. 31, 1980, Ser. No. 136,016

Int. Cl.³ C07D *471/18;* A61K *31/40*

U.S. Cl. 546—70 **6 Claims**

1. A compound of the formula



and to their pharmaceutically acceptable alkali metal, lower alkyl and benzyl quaternary and acid addition salts wherein

R is hydrogen or lower alkyl,

X and Y each are hydrogen, hydroxy, lower alkoxy and lower alkyl, and

Q is $(CH_2)n$ wherein n is 2 or 3.

4,360,674

NAPHTH[1,2-d]IMIDAZOLES

Amedeo Omodei-Salé, Voghera, and Emilio Toia, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

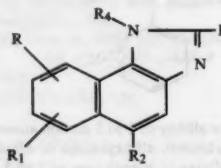
Filed Jan. 30, 1981, Ser. No. 230,135

Claims priority, application United Kingdom, Feb. 8, 1980, 8004311

Int. Cl.³ C07D *403/06*

U.S. Cl. 546—199 **1 Claim**

1. A compound of the formula



wherein

R and R_1, each independently, are selected from the group consisting of hydrogen, halogen, $(C_1–C_6)$alkyl and $(C_1–C_6)$alkoxy;

R_2 represents hydrogen or halogen;

R_3 represents a $—(CH_2)_n—NR_5R_6$ group wherein

n is 2 or 3

and

R_5 and R_6 taken together with the adjacent nitrogen atom represent a piperidino moiety optionally having a substituent selected from the group consisting of $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_5–C_6)$cycloalkyl, $(C_2–C_6$alkanoyl, phenyl, phenyl substituted with 1 to 3 groups independently selected from $(C_1–C_6)$alkyl, $(C_1–C_6)$alkoxy, hydroxy, benzyloxy, halogen, trifluoromethyl, amino, mono- and di-alkylamino and nitro, benzyl, and halobenzyl;

R_4 represents $(C_1–C_6)$alkyl; or a non-toxic pharmaceutically-acceptable acid addition salt of the compound.

4,360,675

HOMOPOLYMERS AND COPOLYMERS OF VINYL ETHERS OF POLYALKYLPIPERIDINOLS AND THEIR USE AS STABILIZERS FOR PLASTICS

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

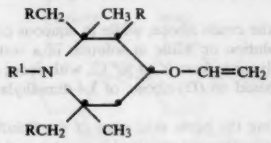
Division of Ser. No. 118,356, Feb. 4, 1980, Pat. No. 4,311,820. This application Oct. 15, 1981, Ser. No. 311,562

Claims priority, application Switzerland, Feb. 14, 1979, 1465/79

Int. Cl.³ C07D *211/46*

U.S. Cl. 546—216 **1 Claim**

1. A vinyl ether of the formula I



(I)

in which R is hydrogen or CH_3 and R^1 is hydrogen, $C_1–C_8$-alkyl, benzyl, allyl, formyl or acetyl.

4,360,676

3,3,5-TRICHLOROGLUTARIC ACID IMIDE

Pierre Martin, Rheinfelden, and Daniel Bellus, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,576

Claims priority, application Switzerland, Nov. 30, 1979, 10661/79

Int. Cl.³ C07D *211/38*

U.S. Cl. 546—243 **1 Claim**

1. 3,3,5-Trichloroglutaric acid imide.

4,360,677

HERBICIDAL 2-(ALPHA-CHLOROMETHYLSULFONYL) PYRIDINE-1-OXIDES

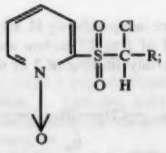
Arthur M. P. Doweyko, Naugatuck; Richard R. Regis, Harwinton, and Allyn R. Bell, Cheshire, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,431

Int. Cl.³ C07D *213/64*

U.S. Cl. 546—294 **12 Claims**

1. A compound of the formula



wherein

R is selected from the group consisting of: phenyl;

phenyl substituted with one of the substituents C_1 to C_8 alkyl, C_1 to C_8 alkoxy, phenoxy, halogen, trifluoromethyl, trichloromethyl, or nitro;

2-naphthyl; and

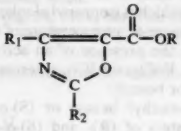
2-(2',2'-dichloro-1'-methylcyclopropyl).

4,360,678
2-SUBSTITUTED-4-ALKYL OR TRIHALOALKYL-5-DIAZOLECARBOXYLIC ACIDS

Robert K. Howe, Bridgeton, and Len F. Lee, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 80,747, Oct. 1, 1979, Pat. No. 4,303,439.
This application Jul. 27, 1981, Ser. No. 286,733
Int. Cl.³ C07D *263/34, 263/38*
U.S. Cl. 548—236 **11 Claims**

1. A compound having the formula



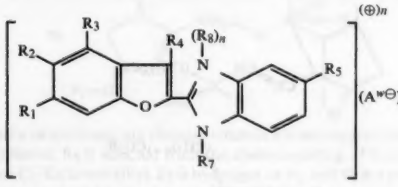
wherein R is hydrogen, alkyl containing 1 to 5 carbon atoms, halo alkyl containing 1 to 5 carbon atoms or agriculturally acceptable cations; R_1 is alkyl containing 1 to 5 carbon atoms or polyhaloalkyl containing 1 to 5 carbon atoms; R_2 is alkoxy containing 1 to 5 carbon atoms, halogen, or phenoxy.

4,360,679
BENZOFURANYL-BENZIMIDAZOLES

Hans R. Meyer, Binningen, and Kurt Weber, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 972,139, Dec. 21, 1978, Pat. No. 4,250,317, which is a division of Ser. No. 815,889, Jul. 15, 1977, Pat. No. 4,146,725. This application Sep. 30, 1980, Ser. No. 192,576
Claims priority, application Luxembourg, Jul. 26, 1976, 75458; Apr. 27, 1977, 77216
Int. Cl.³ C07D *405/04, 405/14*
U.S. Cl. 548—327 **5 Claims**

1. A benzofuranyl-benzimidazole of the formula



wherein

R_1 represents alkoxy of 1 to 12 carbon atoms, alkenyloxy of 3 or 4 carbon atoms, phenoxy or phenylalkoxy containing 1 to 4 carbon atoms in the alkoxy moiety which is unsubstituted or substituted in the phenyl moiety by chlorine, alkyl or alkoxy, each of 1 to 4 carbon atoms, or represents hydroxy-(C_1–C_4)-alkoxy, (C_1–C_4)-alkoxy-(C_1–C_4)-alkoxy, cyano-(C_1–C_4)-alkoxy, carb-(C_1–C_4)-alkoxy-(C_1–C_4)-alkoxy, carbamoyl-(C_1–C_4)-alkoxy or cyclohexyloxy or represents hydrogen if R_2 and R_3 together form butadienylene, or together with R_2 forms methylenedioxy or ethylenedioxy,

R_2 represents a hydrogen or halogen atom, alkyl or alkoxy, each of 1 to 4 carbon atoms, or, if R_1 represents hydrogen, together with R_3 forms butadienylene, or together with R_1 forms methylenedioxy or ethylenedioxy,

R_3 represents a hydrogen atom, alkyl or alkoxy, each of 1 to 4 carbon atoms, or, if R_1 represents hydrogen, together with R_2 forms butadienylene,

R_4 represents hydrogen, alkyl or alkoxy, each of 1 to 4 carbon atoms, or phenyl,

R_7 represents alkyl of 1 to 8 carbon atoms, alkenyl of 3 to 4 carbon atoms, cyclohexyl, hydroxyalkyl of 2 to 4 carbon atoms, alkoxyalkyl of altogether 3 to 6 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, carbalkoxyalkyl of altogether 3 to 9 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, benzyl which is unsubstituted or substituted by chlorine, methyl or methoxy; dialkylaminoalkyl of altogether 3 to 7 carbon atoms or phenethyl, or, if n is 0, also represents hydrogen,

R_8 represents hydrogen, alkyl or 1 to 6 carbon atoms, hydroxyalkyl of 2 to 4 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, carbamoylalkyl of 2 to 6 carbon atoms, alkoxycarbonylalkyl of altogether 3 to 9 carbon atoms, alkenyl of 3 to 4 carbon atoms, or benzyl which is unsubstituted or substituted by chlorine, methoxy or methyl,

R_5 represents cyano or trifluoromethyl,

n is 0 or 1,

$A^{w\ominus}$ represents a colourless anion and

w represents the valency of the anion A.

4,360,680
THERAPEUTICALLY ACTIVE 3-AMINO-1-PHENYL AND SUBSTITUTED PHENYL-2-PYRAZOLINES

John P. Dusza, Nanuet, N.Y.; Joseph P. Joseph, Montvale, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 13, 1981, Ser. No. 282,905
Int. Cl.³ C07D *231/06*
U.S. Cl. 548—362 **3 Claims**

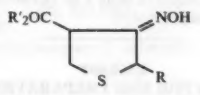
1. The compound, 3-amino-1-(4-biphenylyl)-5-methyl-2-pyrazoline.

4,360,681
NOVEL THIOPHENE COMPOUNDS

Pasquale N. Confalone, Bloomfield; Giacomo Pizzolato, Belleville, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 105,804, Dec. 20, 1979, Pat. No. 4,299,968, which is a continuation of Ser. No. 931,238, Aug. 7, 1978, abandoned, which is a continuation of Ser. No. 716,854, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 421,460, Dec. 3, 1973, Pat. No. 3,978,084. This application Jun. 25, 1981, Ser. No. 277,567
Int. Cl.³ C07D *333/24*
U.S. Cl. 549—68 **3 Claims**

1. A compound of the formula:



VI

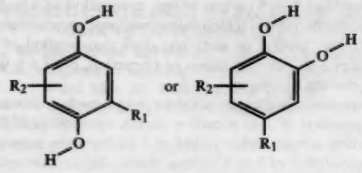
wherein R'_2 is lower alkoxy and R is aryl or aralkyl.

4,360,682
STABILIZING CAPROLACTONES WITH DIHYDROXYBENZENES

Herbert Klenk; Rolf Wirthwein, both of Hanau; Helmut Waldmann, Leverkusen, and Hermann Seifert, Cologne, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silberscheideanstalt vormals Roessler, Frankfurt am Main and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 148,869
Claims priority, application Fed. Rep. of Germany, May 23, 1979, 2920847
Int. Cl.³ C07D *313/04*
U.S. Cl. 549—266 **9 Claims**

1. A composition consisting essentially of caprolactone and a color stabilizing amount of a dihydroxybenzene of the formula



in which

R_1 is alkyl of 1 to 8 carbon atoms, and

R_2 is hydrogen.

4,360,683

ANTIBIOTIC NODUSMICIN DERIVATIVES

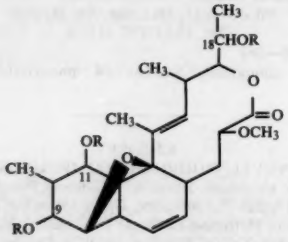
Barney J. Magerlein, and Howard A. Whaley, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 6, 1980, Ser. No. 175,409

Int. Cl.³ C07D *313/00*

U.S. Cl. 549—266 **11 Claims**

1. A compound of the formula



wherein R is H in no more than two positions at the same time, a blocking group which will be removed prior to the obtention of the end product, said blocking group selected from the group consisting of trisubstituted silyl ethers, tetrahydropyranyl ethers, β,β,β-trichloroethyl ether, and carbonate esters in at least one position, or an hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive; or a halo-, nitro-, hydroxy-, amino-, cyano-, thiocyano-, or loweralkoxy-substituted hydrocarbon acyl radical of from 2 to 18 carbon atoms, inclusive; and loweralkoxycarbonyl.

4,360,684

PROCESS FOR THE PREPARATION OF (2S)-TETRAHYDRO-2α-METHYL-6-OXO-4β-AMINO-2H-PYRAN-3α-CARBOXYLIC ACID

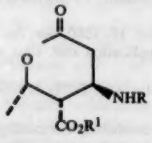
Raymond J. Cvetovich, Roselle Park; David G. Melillo, Scotch Plains; Kenneth M. Ryan, Clark, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 8, 1981, Ser. No. 252,492

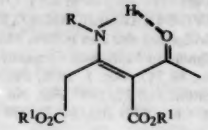
Int. Cl.³ C07D *309/30*

U.S. Cl. 549—291 **2 Claims**

1. A stereoselective reductive process for preparing



comprising reaction of



with 1–100 atmospheres pressure hydrogen gas, in the presence of a catalytic amount of PtO_2, Pd/C, Pt/C, or Raney nickel; in a solvent which is isopropyl alcohol, methanol, ether, ethyl acetate or toluene; at a temperature of 0°–85° C. for from 2–72 hours; and in the presence of an activating Lewis acid which is $BF_3.OEt_2$, $FeCl_3$ or $AlCl_3$; wherein R^1 is alkyl having 1–6 carbon atoms or benzyl;

and R is (R)-α-methyl benzyl or (S)-α-methylbenzyl or lower alkyl esters of (R)- and (S)-α-carboxybenzyl or benzyl esters of (R)-and (S)-α-carboxy-benzyl.

4,360,685

DIOXATRICYCLIC PROSTACYCLIN ANALOGS

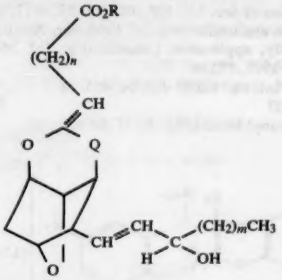
Martin F. Haslanger, Lambertville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 25, 1981, Ser. No. 305,663

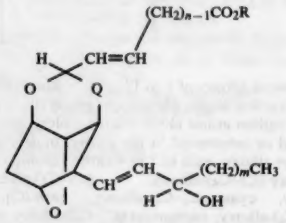
Int. Cl.³ C07D *311/78, 307/93*

U.S. Cl. 549—386 **24 Claims**

1. A compound having the structural formula



or



and including all stereoisomers thereof, wherein R is hydrogen or lower alkyl, Q is a single bond or $—CH_2—$, m is 1 to 9, and n is 3 or 4.

4,360,686

SILYLATION OF ORGANIC COMPOUNDS

Pen-Chung Wang, and James M. Renga, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 3, 1981, Ser. No. 298,852

Int. Cl.³ C07F *7/08, 7/10, 7/18*

U.S. Cl. 556—419 **8 Claims**

1. A process for the silylation of active hydrogen-containing

compounds of up to about 20 carbons selected from the group consisting of hydroxyl- or thiol-substituted aromatic compounds, carboxylic acids, amides, β-ketoesters and ethynyl-containing compounds comprising reacting the active hydrogen-containing compound with trimethylsilyl trichloroacetate at elevated temperatures in the presence of an initiator.

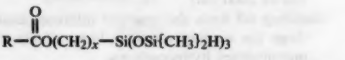
4,360,687

SILOXANE CROSSLINKERS

Ollie W. Marko, Carrollton, Ky., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 24, 1981, Ser. No. 295,411
Int. Cl.³ C07F *7/08*
U.S. Cl. 556—440 **2 Claims**

1. A compound according to the formula:



wherein R is selected from the group consisting of alkyl having 1 to 4 carbon atoms, trifluoromethyl and phenyl, and x is an integer of 2 to 4.

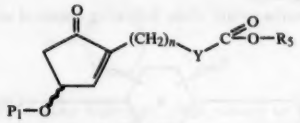
4,360,688

PRECURSORS AND SYNTHESIS OF D1-(METHYL)-16,16-(DIMETHYL)-11-ALPHA, 15-ALPHA, BETA-DIHYDROXY-9-OXO-2,13,-TRANS, TRANS-PROSTADIENOATES

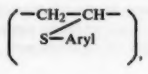
Middleton B. Floyd, Jr., Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 21, 1981, Ser. No. 266,004
Int. Cl.³ C07L *177/00*
U.S. Cl. 556—441 **7 Claims**

1. Optically active compounds of the formula



and a racemic mixture thereof, wherein n is an integer from 3–5 inclusive, R_5 is selected from the class consisting of hydrogen and C_1–C_6 lower alkyl, P_1 is hydrogen or P_2, and P_2 is a protective group stable to 1,4 conjugate addition conditions and wherein —Y— is a divalent moiety selected from the class consisting of trans-(CH=CH—) and



wherein Aryl is selected from the class consisting essentially of phenyl and phenyl substituted with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or trifluoromethyl.

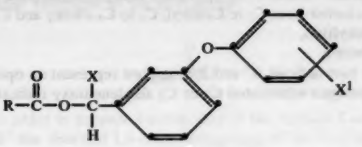
4,360,689

α-HALOBENZYL ESTERS

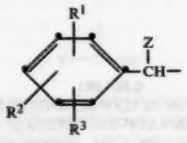
Charles H. Tieman, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed May 12, 1980, Ser. No. 148,872
Int. Cl.³ C07C *69/612, 121/75;* C07D *317/60*
U.S. Cl. 560—55 **8 Claims**

1. A compound of the formula:



wherein X is a chlorine, flourine, or bromine atom; X^1 is a hydrogen atom; and R is a group selected from formula IX:



IX

wherein R_1 is a member selected from the group consisting of hydrogen, methoxy, ethoxy, acetoxy, methylsulfinyl, difluoromethoxy, trifluoromethoxy, C_1–C_4 alkyl, trifluoromethyl, allyl, acetyl, ethoxycarbonyl, methylthio, chlorine, fluorine, iodine, isopropenyl, propargyl, methoxymethyl, ethoxymethyl, chloroallyl, butyryl, butylthio, allyloxycarbonyl, nitro and methoxycarbonyl; R^2 is a member selected from the group consisting of hydrogen, methyl, methoxy, chlorine and bromine; or R^1 and R^2 together are methylenedioxy, trimethylene or tetramethylene; R_3 is hydrogen or methyl; Z is a member selected from the group consisting of C_1–C_4 alkyl, ethoxy, allyl, bromoethyl, cyclohexyl, cyclopropylmethyl, isopropenyl, propargyl, trifluoromethyl and cyano.

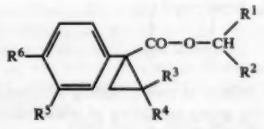
4,360,690

COMBATING PESTS WITH 1-ARYL-CYCLOPROPANE-1-CARBOXYLIC ACID ESTERS

Rainer Fuchs, Wuppertal; Klaus Naumann, Leverkusen; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 272,863
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025218
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—57 **10 Claims**

1. A 1-aryl-cyclopropane-1-carboxylic acid ester of the formula



in which

R^1 represents a hydrogen atom, a cyano radical or an alkyl, alkenyl or alkinyl radical with in each case up to 7 carbon atoms, and

R^2 represents a phenyl radical which is substituted by halogen and/or optionally halogen-substituted phenoxy, with the proviso that the radical R^2 in total contains at least one fluorine substituent,

R^3 and R^4, which can be identical or different, represents a fluorine, chlorine or bromine atom or a methyl radical,

R^5 represents a hydrogen or halogen atom or a methyl or methoxy radical, and

R^6 represents a hydrogen or halogen atom, a cyano nitro or amino radical or an optionally halogen-substituted radical selected from C_1 to C_4 alkyl, C_1 to C_4 alkoxy and C_1 to C_4 alkylthio,

or wherein

the two radicals R^5 and R^6 together represent an optionally halogen-substituted C_1 or C_2 alkylenedioxy radical.

4,360,691

PRODUCTION OF MALONIC ANHYDRIDES AND DERIVATIVES THEREOF

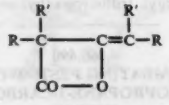
Charles L. Perrin, La Jolla, Calif., assignor to The Regents of the University of California, Los Angeles, Calif.

Division of Ser. No. 904,830, May 11, 1978, Pat. No. 4,251,447. This application Aug. 25, 1980, Ser. No. 180,851

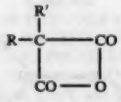
Int. Cl.³ C07C *67/08, 51/083, 103/14*

U.S. Cl. 560—131 **10 Claims**

1. A process for producing a derivative of a malonic anhydride selected from the group consisting of a malonic acid, a malonic acid monoester and a malonic acid monoamide, which comprises passing ozone through an inert organic solvent containing an enol-lactone dimer of a ketene, said dimer of a ketene having the general formula



where R and R′ are selected from the group consisting of hydrogen, alkyl having a chain length ranging from C_1 to C_{20}, cycloalkyl containing from about 3 to about 8 carbon atoms, carbocyclic aryl, said aryl groups containing from about 6 to about 20 carbon atoms, and where R and R′ can be the same or different, and where R and R′ together can constitute the atoms necessary to form a carbocyclic ring of from about 4 to about 8 carbon atoms, said solvent being maintained at a temperature ranging from about −100° C. to about 0° C., and forming a malonic anhydride having the formula



where R and R′ are defined as above, adding a derivatizing agent selected from the group consisting of water, alcohols, phenols, ammonia and amines to the reaction mixture, and permitting the reaction mixture to warm to about room temperature.

5. The process as defined in claim 1, wherein said ketene dimer is 3-hydroxy-2,2,4-trimethyl-3-pentenoic acid β-lactone, and wherein said malonic anhydride is dimethyl malonic anhydride.

6. The process as defined in claim 5, wherein sufficient of said derivatizing agent is employed to produce a high yield of dimethylmalonic acid, a monoester of dimethyl malonic acid, or a monoamide of dimethyl malonic acid, based on said ketene dimer.

4,360,692

PREPARATION OF FORMYLVALERATES

Rudolf Kummer, Frankenthal, and Heinz-Walter Schneider, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,569

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2951950

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—175 **3 Claims**

1. A process for the preparation of an alkyl formylvalerate which comprises:

reacting butadiene or a butadiene-containing hydrocarbon mixture, in a first stage, with carbon monoxide and an alkanol in the presence of a cobalt carbonyl complex catalyst and in the presence of from 0.5 to 2 moles of a tertiary nitrogen base having a pK_a of from 3 to 11 at a temperature of from 80° to 150° C. and a pressure from 300 to 2000 bar;

distilling off from the reaction mixture obtained in the first stage the tertiary nitrogen base, excess alkanol and any unconverted hydrocarbons;

contacting the reaction mixture prior to or during said distillation step with molecular oxygen, and, thereafter in a second stage

reacting the alkyl pentenoate formed in the first stage with carbon monoxide and hydrogen in the presence of the residual cobalt catalyst from the first stage at a temperature of from 100° to 160° C. and a pressure of from 100 to 300 bar.

4,360,693

1,4-BIS[(3′-METHACROYL-2′-HYDROXYPROPOXY)METHYL]CYCLOHEXANE DERIVATIVES THEREOF

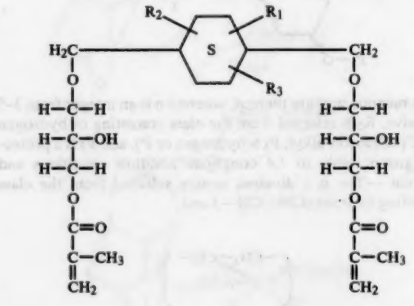
Jan A. Orlowski, Altadena, Calif., assignor to Scientific Pharmaceuticals, Inc., Duarte, Calif.

Continuation-in-part of Ser. No. 158,582, Jun. 11, 1980, Pat. No. 4,304,893. This application Apr. 7, 1981, Ser. No. 251,915

Int. Cl.³ C07C *69/602*

U.S. Cl. 560—220 **3 Claims**

1. A dimethacrylate of the following chemical structure:



where

is a saturated, 6 membered, monocyclic, hydrocarbyl ring system; and

R_1, R_2 and R_3 are the same or different and are hydrogen or alkyl or alkoxy groups having 1 to 12 carbon atoms.

2. A dimethyacrylate according to claim 1 wherein R_1, R_2 and R_3 have 1 to 4 carbon atoms.

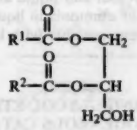
4,360,694

PROCESS FOR PREPARING 1,2-DIACYL-SN-GLYCEROLS

Paavo K. J. Kinnunen; Tom M. Schröder, and Jorma A. Virtanen, all of Espoo, Finland, assignors to KSV-Chemicals Oy, Espoo, Finland

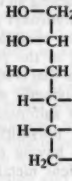
Filed Apr. 6, 1981, Ser. No. 251,364
Claims priority, application Finland, Apr. 9, 1980, 801116
Int. Cl.³ C09F 5/08; C11C 3/02; C07C 67/02
U.S. Cl. 560—263 15 Claims

1. Process for preparing 1,2-diacyl-sn-glycerols having the formula



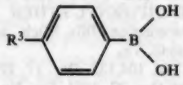
I

wherein R^1 and R^2 are the same or different and denote an optionally substituted saturated or unsaturated alkyl group, characterized in that D-mannitol of the formula



II

in a solent is reacted with a benzene boronic acid of the formula

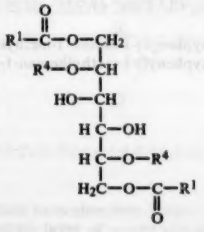


III

wherein R^3 denotes hydrogen, alkyl, alkoxy or halogen, or with a derivative thereof, and the product obtained, without prior isolation, is reacted with a functional derivative of an acid of the formula

IV

wherein R^1 has the meaning given above, in the presence of a tertiary amine, the benzeneboronate protection is removed by hydrolysis or alcoholysis whereby a 1,6-diacyl- or a 1,2,5,6-tetra-acyl-D-mannitol, respectively, is obtained having the formula



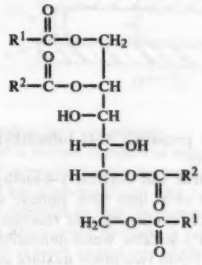
V

wherein R^1 has the meaning given above and both R^4 groups are either hydrogen or the acyl group

and, in order to prepare a compound of the formula I wherein $R^1 \neq R^2$ the obtained 1,6-diacyl-compound of the formula V is reacted as described above with a benzene boronic acid having the formula III or a derivative thereof and the protected 1,6-diacyl-D-mannitol thus obtained is reacted with a functional derivative of an acid having the formula

VI

wherein R^2 has the meaning given above, in the presence of a tertiary amine, the benzeneboronate protection is removed by hydrolysis or alcoholysis, whereby a compound is obtained having the formula



VII

wherein $R^1 \neq R^2$, and the 1,2,5,6-tetracyl compound of formula V or of the formula VII is split by oxidation and subsequently reduced with a hydride reducing agent to form the desired compounds of formula I.

4,360,695

CONTINUOUS PREPARATION OF ADIPTIC ACID

Peter Magnussen, Bad Durkheim; Volker Schumacher, Frankenthal; Wolfgang Gebert, Wesseling; Heinrich Reitz, Mannheim, and Werner Praetorius, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 7, 1982, Ser. No. 337,684
Int. Cl.³ B01D 3/14; C07C 54/14
U.S. Cl. 562—590 5 Claims

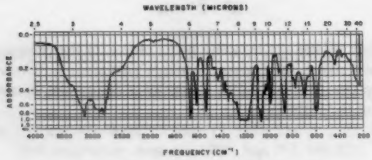
1. In a process for the continuous preparation of adipic acid by hydrolysis of C_1–C_4-alkyl adipates with water at an elevated temperature in the presence of a strongly acidic ion exchanger, the improvement that the esters and excess water are fed to the middle section of a column, reaction mixture is taken off at a plurality of trays of the column below the feed point, passed over a strongly acidic ion exchanger and recycled, alkanols or alkanol/water mixtures are taken off at the top of the column and an aqueous solution of adipic acid is taken off at the bottom of the column.

4,360,696

PROCESS FOR THE PREPARATION OF DIACETONE ACRYLAMIDE

Henry Richmond, White House Station, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 920,040, Jun. 28, 1978, Pat. No. 4,239,885, which is a continuation-in-part of Ser. No. 859,623, Dec. 12, 1977, abandoned. This application Jun. 2, 1980, Ser. No. 155,734
The portion of the term of this patent subsequent to Feb. 20, 1996, has been disclaimed.
Int. Cl.³ C07C *102/02*
U.S. Cl. 564—206 5 Claims



1. A process for preparing N-(1,1-dimethyl-3-oxobutyl)acrylamide comprising:

reacting acrylonitrile and 4-hydroxy-4-methyl-2-pentanone in the presence of at least 93% sulfuric acid to form a reaction mixture; contacting said reaction mixture with water and with a suitable water-immiscible organic solvent to form a liquid two-phase mixture consisting of an aqueous phase and an organic phase;

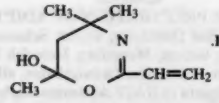
neutralizing or alkalizing the aqueous phase with an alkalizing agent;

separating the neutralized or alkalized aqueous phase; and

recovering N-(1,1-dimethyl-3-oxobutyl)acrylamide from the organic phase,

the improvement comprising, between the reaction step and the contacting step:

cooling the reaction mixture to about 15° C. and adding a suitable organic solvent thereto, while maintaining the temperature at about 15°–20° C., to precipitate a crystalline intermediate reaction product from said reaction mixture having the formula



and

washing said intermediate reaction product with a suitable organic solvent to remove oily impurities and sulfuric acid therefrom.

4,360,697

PROCESS FOR THE PRODUCTION OF 1-AMINO-PROPANEDIOL-2,3

Axel Kleemann; Robert Nygren, and Rudolf Wagner, all of Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 9, 1981, Ser. No. 252,609
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3014129
Int. Cl.³ C07C *89/02, 91/10*
U.S. Cl. 564—475 42 Claims

1. In a process for the production of 1-amino-propanediol-2,3 by the reaction of glycidol with ammonia the improvement comprising reacting glycidol and liquid ammonia under pressure sufficient to keep the ammonia in liquid form in the presence of an organic solvent miscible with liquid ammonia.

4,360,698

PROCESS FOR MAKING GLYCOL ETHERS UTILIZING A HETEROGENEOUS CATALYST

James H. Sedon, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1981, Ser. No. 286,093
Int. Cl.³ C07C *41/03*
U.S. Cl. 568—618 19 Claims

1. A process comprising reacting an organic compound (A) having at least one aliphatic hydroxyl group with an oxirane compound (B) under reaction conditions to form a glycol ether, said process occurring in the presence of a catalytic amount of a polymeric material that is substantially insoluble in the reaction mixture, said polymeric material being selected from the group consisting of sulfonated styrene-divinylbenzene copolymers, sulfonated polyethylene resins, and perfluorosulfonic acid polymers having a plurality of pendant sulfonate moieties with divalent metal counterions selected from the group of 2a, 2b and 8 elements of the Periodic Table.

4,360,699

PROCESS FOR PREPARING A 3-PHENOXYTOLUENE AND DIPHENYL ETHER

William E. Wright, Farmington Hills, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 104,132, Dec. 17, 1979, abandoned. This application Dec. 23, 1981, Ser. No. 333,708
Int. Cl.³ C07C *41/09*
U.S. Cl. 568—635 2 Claims

1. A process for making a major portion of 3-phenoxytoluene and a minor portion of diphenyl ether, said process comprising heating a mixture of about 1 to 3 mole parts phenol, 1 mole part m-cresol and 0.1 or more gram-atom parts aluminum or mole parts aluminum phenoxide forming compound in an autoclave at a temperature of about 300°–375° C.

4,360,700

INTERMEDIATES FOR MAKING 1-(3-BENZYLOXYPHENYL)-1,1-DIMETHYLHEPTANE

Lawrence S. Melvin, Jr, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,223
Int. Cl.³ C07C *43/225, 43/23*
U.S. Cl. 568—644 2 Claims

1. 1-(3-Benzyloxyphenyl)-1-chloro-1-methylheptane.

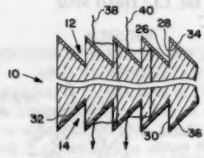
2. 2-(3-Benzyloxyphenyl)-1-methylheptan-1-ol.

4,360,701

HEAT TRANSPARENT HIGH INTENSITY HIGH EFFICIENCY SOLAR CELL

John C. Evans, Jr., Ravenna, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 15, 1981, Ser. No. 264,380
Int. Cl.³ H01L 31/06
U.S. Cl. 136—259 17 Claims



1. A heat transparent high intensity solar cell having improved efficiency comprising

a semiconductor substrate having a plurality of grooves on at least one surface thereof, each of said grooves having a first face substantially normal to said surface and a second face angularly disposed to said first surface,

a photovoltaic junction in said substrate adjacent to said grooves, said junction having one portion in substantial juxtaposition with said first face and another portion in substantial juxtaposition with said second face, and

reflecting means adjacent to said second face of each groove, said reflecting means including

a first mirror surface for directing entering light rays into said solar cell through said first face to traverse said one portion of said junction, and for directing emerging light rays from said first face of said groove away from said solar cell after traversing said one portion of said junction, and

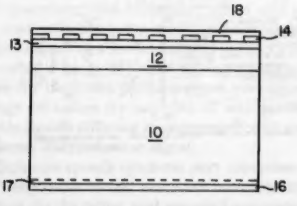
a second mirror surface oppositely disposed from said first mirror surface for directing said entering light rays toward an opposite surface of said solar cell whereby said entering light rays repeatedly traverse said other portion of said junction, and for directing said emerging light rays toward said first face whereby said emerging light rays repeatedly traverse said other portion of said junction.

4,360,702

COPPER OXIDE/N-SILICON HETEROJUNCTION PHOTOVOLTAIC DEVICE

Tom Feng, Morris Plains, and Amal K. Ghosh, New Providence, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 5, 1981, Ser. No. 222,368
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—261 12 Claims



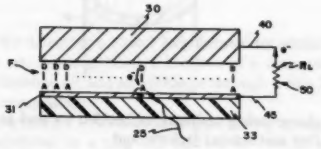
1. A photovoltaic heterojunction device comprising a relatively thick substrate layer of n-type silicon having a major area surface; a relatively thin layer of copper deposited onto said silicon surface and subsequently oxidized to form a layer of Cu_xO where x is an integer being 1 or 2, said Cu_xO layer forming a heterojunction to said silicon, and means making ohmic contact to said silicon and Cu_xO layers.

4,360,703

PHOTOVOLTAIC CELL HAVING P-N JUNCTION OF ORGANIC MATERIALS

James R. Bolton; Te-Fu Ho, and Alan R. McIntosh, all of London, Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Apr. 28, 1981, Ser. No. 258,278
Int. Cl.³ H01L 31/06
U.S. Cl. 136—263 18 Claims



1. A photovoltaic cell comprising;

(a) a first and a second conductive material;

(b) a film of mono-molecular thickness, the film possessing molecules each having donor and acceptor regions, the molecules oriented so that the donor regions of adjacent molecules are aligned and are in relative juxtaposition, with donor regions against one of the conductive materials, and the acceptor regions aligned and adhered to the second conductive material;

(c) one of the said conductive materials being transparent to light;

(d) electrodes attached to the conductive materials; and,

(e) means for connecting a load across the electrodes whereby, when the light penetrates into the molecules of the film, electrical energy flows through the load.

4,360,704

MOISTURE PROOF ELECTRICAL CABLE

Peter Madry, Barsinghausen, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshütte AG, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 13,819, Feb. 22, 1979, abandoned. This application Dec. 18, 1980, Ser. No. 217,622
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807767
Int. Cl.³ H01B 7/22
U.S. Cl. 174—36 7 Claims

1. Electrical cable for medium and high voltages, and including a conductor core with insulating jacket covered by an electrically conductive layer, further comprising:

a shield made of metallic, elongated elements such as ribbons or wires on the said layer;

a first plastically deformable jacket on the layer and sealingly embedding said ribbons or wires of said shield;

a water-vapor-impermeable sleeve on the first jacket and being comprised of a helically coiled metal or metallized ribbon having adjoining edges sealingly interconnected, the sleeve being sealed by the first jacket;

a second, plastically deformable, water-proofing jacket on the sleeve and sealing the sleeve from its outside, the

sleeve being sealingly embedded by and in between the first and second jackets; and

protective cover means on the second jacket.

4,360,705

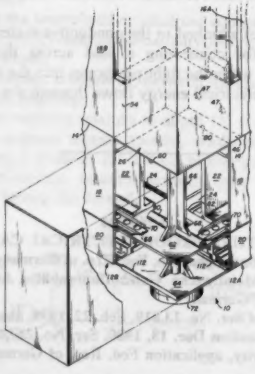
PANEL RACEWAY SYSTEM CORNER FITTING

Wilfred R. Rogers, Bristol, Conn., assignor to The Wiremold Company, West Hartford, Conn.

Filed Jun. 9, 1981, Ser. No. 272,052

Int. Cl.³ H02G 3/00

U.S. Cl. 174—48 **13 Claims**



1. A panel wiring system comprising a pair of raceways having corresponding generally rectangular cross-sectional configurations including upper, lower and side walls, mounted in underlying relation to upstream and downstream panels joined by connecting means, including a corner panel post,

a corner fitting in underlying relation to the corner panel post for interconnecting the pair of raceways,

the corner fitting including upper and lower plates and an upright post integrally connecting the plates,

the upper and lower plates respectively being generally aligned with upper and lower walls of the raceways, and

the corner fitting post being disposed within the confines of each plate in spaced unobstructing relation to its side edges for selectively orienting the corner fitting in relation to different positions of the panels and their respective underlying raceways.

4,360,706

ELECTRIC CABLES OF REDUCED MICRO-VOIDS IN THE EXTRUDED INSULATION

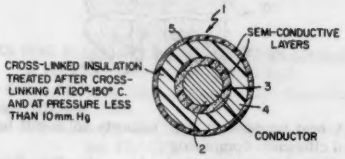
Gianmario Lanfranconi, Trezzo d'Adda, and Bernardino Vecellio, Milan, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Division of Ser. No. 30,726, Apr. 17, 1979, Pat. No. 4,259,281.

This application Apr. 14, 1980, Ser. No. 139,829

Int. Cl.³ H01B 9/02

U.S. Cl. 174—105 SC **4 Claims**



1. An electric cable for use at medium and high voltages, said cable comprising a conductor surrounded by a first semi-conductive layer which is surrounded by solid insulation which in turn is surrounded by second semi-conductive layer, said solid insulation being an extruded, peroxide cross-linked, plastic material which has been treated subsequent to the cross-linking thereof by subjecting it to heat at a temperature in the range from about 120° C. to 150° C. and an ambient pressure less than 10 mm. Hg. to remove decomposition products and reduce the number of micro-voids formed during the cross-linking, said insulation being characterized by a perforation gradient better than the same insulation which has not been so treated, being substantially free of said decomposition products and having a number of micro-voids less than the same insulation which has not been so treated and less than 10^3 per mm^3 whereby the perforation gradient is improved and the stability of the insulating properties of the insulation remains substantially constant with use over a period of time.

4,360,707

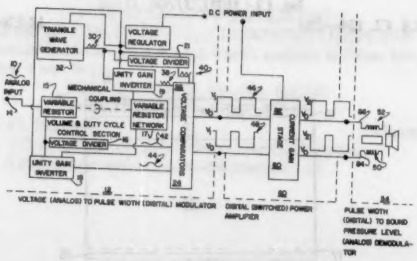
DIGITALLY DRIVEN COMBINATION COILS FOR ELECTRODYNAMIC ACOUSTIC TRANSDUCERS

Joel R. Joseph, Libertyville, Ill., and William F. Bleeke, Vandalia, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Nov. 24, 1980, Ser. No. 209,948

Int. Cl.³ H04R 3/00

U.S. Cl. 179—1 A **15 Claims**



1. In combination with an acoustical transducer having at least two independently addressable coils, a modulator and amplifier comprising means for converting an analog input signal to pulse width modulated signals and amplified output

means for addressing the signals to respective ones of said coils.

4,360,708

SPEECH PROCESSOR HAVING SPEECH ANALYZER AND SYNTHESIZER

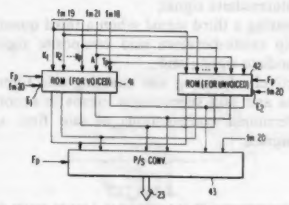
Tetsu Taguchi, and Kazuo Ochiai, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 146,907, May 5, 1980, abandoned, which is a continuation of Ser. No. 25,520, Mar. 30, 1979, abandoned. This application Feb. 20, 1981, Ser. No. 236,428

Claims priority, application Japan, Mar. 30, 1978, 53-37495; Mar. 30, 1978, 53-37496; Apr. 20, 1978, 53-47264; Apr. 24, 1978, 53-48955

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—15.55 R **5 Claims**



1. A speech processor including a speech analysis part for receiving and analyzing a speech sound and generating analysis signals representing said speech sound and a speech analysis part for reproducing said speech sound from said analysis signals, in which said speech analysis part comprises:

means for generating a series of samples at a predetermined frequency representing said speech sound, a predetermined number of successive samples comprising an analysis frame period;

means for receiving said samples and for developing parameter signals including speech sound spectrum and sound source information signals representing said speech sound for each said frame period, said speech sound source information signals including a voiced or unvoiced discrimination signal, pitch period signal and short-time mean power signal; and

means for quantizing and encoding each of said parameter signals, said encoding being performed for predetermined parameter signals in a predetermined number of encoding bits covering a range of values having a high rate of occurrence for each said predetermined parameter signals, said range of values for any one of said predetermined parameter signals differing in accordance with said voiced or unvoiced discrimination signal;

and in which said speech synthesis part comprises:

a decoder responsive to said voiced or unvoiced discrimination signal for decoding said encoded parameter signals; and

a synthesizing digital filter having coefficients determined by said speech sound spectrum information signals and excited by said speech sound source information signals.

4,360,709

LOOP DETECTING CIRCUIT

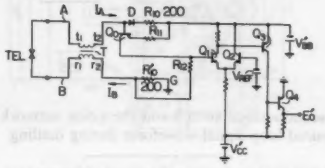
Kazuo Hamazato, Tokyo; Junjiro Kitano, and Tetsuo Takeshita, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Sep. 4, 1980, Ser. No. 184,182

Claims priority, application Japan, Sep. 5, 1979, 54-112806

Int. Cl.³ H04M *3/22*; H04B *3/46*

U.S. Cl. 179—18 FA **11 Claims**



3. A circuit for detecting a closed loop formed by actuation of a telephone set, the loop being indicative of a connection between the telephone set and an exchange through a ring line and a tip line, comprising:

means for generating a first detection signal having an amplitude proportional to a ring line current flowing in said ring line;

means for generating a second detection signal having an amplitude proportional to a tip line current flowing in said tip line, said ring line current and said tip line current flowing simultaneously in said closed loop;

means for summing said first and second detection signals; and

an output means responsive to the output of said summing means, said output means including a comparator and a reference signal source means, the outputs of said summing means and said reference signal source means being fed to said comparator, wherein said first detection signal generating means includes:

a transistor with its base connected with said ring line, a first resistor having one end connected with the emitter of said transistor, a series connection of a diode and a second resistor, the resistor side end of said series connection being connected with the other end of said first resistor as well as with a potential source while the diode side end of said series connection is connected with the base of said transistor, and a third resistor having one end connected with the collector of said transistor; and

further wherein said second detection signal generating means includes:

a resistance means having one end connected with a common potential line and the other end connected with the other end of said third resistor as well as with said tip line.

4,360,710

TELEPHONE CIRCUIT

Guy J. Chaput, Ontario, and Edward M. Sich, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

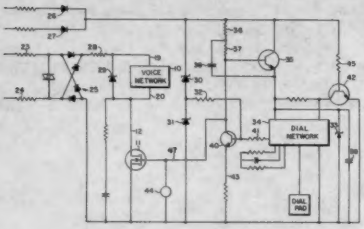
Filed Sep. 25, 1980, Ser. No. 190,902

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **12 Claims**

1. A telephone circuit comprising a solid state voice network, a transconductance switch in series in a high current line with the voice network for dial pulse signalling through the voice network, and a dial network associated with the control input of the transconductance switch to provide low current

dial pulse signalling at the control input, and the voice network includes a current clamp to stabilize the high current through



the transconductance switch and the voice network to establish a desired loop signal waveform during dialling.

4,360,711

MAGNETIC ELECTRO-ACOUSTIC TRANSDUCER CONSTRUCTION

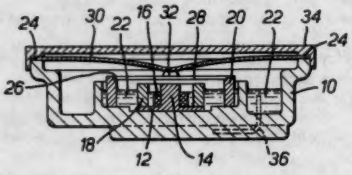
Frederick Steiner, Stapleford, England, assignor to Plessey Overseas Limited, Illford, England

Filed Oct. 20, 1980, Ser. No. 198,652

Claims priority, application United Kingdom, Oct. 20, 1979, 7936508

Int. Cl.³ H04R *11/00, 31/00*

U.S. Cl. 179—115 R **22 Claims**



1. An electro-acoustic transducer comprising a walled housing, a stemmed pole piece mounted on the base of the housing having a stem projecting perpendicularly from a plate, a coil wound on the stem, at least one magnet mounted on the plate of the stemmed pole piece arranged to at least substantially surround the coil, a non-magnetic armature supporting member situated on the base of the housing spaced from and surrounding the at least one magnet and a flexible armature supported on the supporting member, the stemmed pole piece, the coil and the at least one magnet being located in spaced relationship on the base of the housing by a thermo-setting resin, the stemmed pole piece, the supporting member and the walls of the housing being machined after curing of the resin whereby the armature is supported on the supporting member with a predetermined space between the armature and the stemmed pole piece.

4,360,712

DOUBLE TALK DETECTOR FOR ECHO CANCELLERS

Otakar A. Horna, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

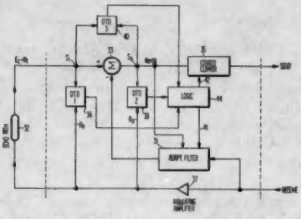
Filed Sep. 5, 1979, Ser. No. 72,813

Int. Cl.³ H04B *3/20*

U.S. Cl. 179—170.2 **23 Claims**

1. In an echo cancellation circuit having a reception line for providing a distant party signal received from a distant party; a transmit line having a near party signal from a near party and an echo signal applied thereto for providing a composite signal; a filter having an adaptation process having enabled and disabled states for receiving said distant party signal at a filter input and producing a signal which estimates said echo signal, said estimated signal being produced after an initial adaptive period; subtraction means for subtracting said estimated signal from said composite signal to produce an intermediate signal along said transmission line; signal suppression means having enbled and disabled states for receiving said intermediate signal and for producing a transmitted signal; the method of selectively enabling and disabling said adaptation process and suppression means comprising the steps of:

(a) generating a first quantitative signal when a first relationship exists between said distant party signal and said composite signal;



(b) generating a second signal when a second quantitative relationship exists between said distant party signal and said intermediate signal;

(c) generating a third signal when a third quantitative relationship exists between said composite signal and said intermediate signal; and

(d) selectively disabling and enabling said filter adaptation process and said suppression means in accordance with predetermined combinations of said first, second, and third signals.

4,360,713

ECHO DETECTOR PARTICULARLY FOR SPEECH INTERPOLATION COMMUNICATION SYSTEMS

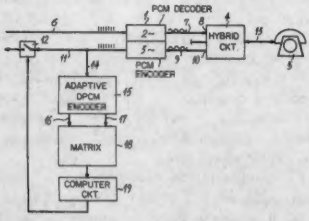
Soumagne Joël, 2560 Rue Troyes, Sherbrooke, Quebec, Canada (J1K 1W9)

Filed Mar. 10, 1980, Ser. No. 128,384

Claims priority, application France, Dec. 3, 1979, 79 06671

Int. Cl.³ H04B *3/20*

U.S. Cl. 179—170.2 **4 Claims**



1. An echo detector, comprising circuit means for digital differential coding of incoming signals which can include an echo signal including means for generating an error signal responsive to an incoming signal and a predicted signal, first means for dividing said error signal by an average value of a certain number of samples of previously received incoming signals, the sign of said average being the same as the sign of the second-last received sample, second means for dividing the quotient obtained by said first dividing means by the average value of a certain number of such previously computed quotients, first logic circuit means for determining the logarithm to

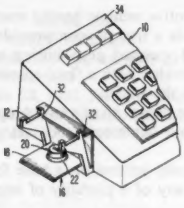
the base 2 of the average value for the incoming signal samples, and second logic circuit means for determining the logarithm to the base 2 of the average value of the quotients, for which only the integer portion is kept, a set of forming two values for each sample for defining one point in a matrix of points, said echo detector further including first counter means for counting a certain number of sets of two values for which the corresponding points are above or on the secondary diagonal of the matrix, second counter means for counting simultaneously the number of sets of values for which the corresponding points are below or on said secondary diagonal, divider means for carrying out the quotient of the count from the first and the second counter, and comparing means for comparing said quotient to a predetermined value to determine if it is greater than said predetermined value, whereby a determination that said quotient is greater indicates that the incoming signal is an echo signal and not an information signal.

4,360,714

TELEPHONE MOVEABLE CRADLE LOCK

Kurt E. Hellwig, Downingtown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 2, 1980, Ser. No. 183,060
Int. Cl.³ H04M *1/66*
U.S. Cl. 179—189 R **16 Claims**



1. A device for securing a telecommunications transceiver in an electrically inactive state, said transceiver characterized as having a cradle mounted on a side of its base, said transceiver in an electrically inactive state when said cradle is in a depressed position, said device comprising:

frame means, insertable between said cradle and the base of said transceiver without disassembly of said transceiver, said frame means for depressing and holding said cradle in said depressed position; and

locking means, fixed to said frame means, said locking means for preventing the removal of said frame means from said transceiver, said locking means including

a circular type lock, and

a latch bar, connected to the cylinder of said lock and rotatable to engage said latch bar under and against said cradle, thereby preventing the removal of said device from said transceiver.

9. A device for use with a Call Director telephone set to prohibit anyone from using the set while it is unattended, said device comprising:

frame means, insertable between the vertical portions of the switchhook arms and the base of the telephone set without disassembly of said telephone set, said frame means for depressing and holding the switchhook arms in a depressed position;

a circular type lock mounted on said frame means, said lock secured to said frame to hinder its removal; and

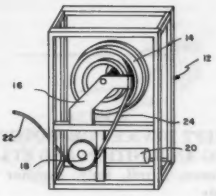
a latch bar connected to the rotatable portion of said lock.

4,360,715

REEL ASSEMBLY FOR FLEXIBLE TUBING AND THE LIKE

Thomas D. Jamison, Fort Oglethorpe, Ga., and Frank T. Radcliff, Chattanooga, Tenn., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 25, 1980, Ser. No. 115,506
Int. Cl.³ H02G *11/00*
U.S. Cl. 191—12.2 R **6 Claims**



1. A reel assembly for flexible tubing and the like comprising a support structure,

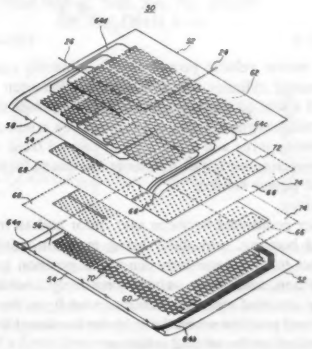
a reel rotatably supported by said structure, said reel having a central bearing mount, an outer wall having an inner surface spaced from central bearing mount for receiving coils of tubing, an inner wall spaced from said outer wall for confining coils of tubing, an open end for receiving tubing and the like with said outer wall tapering inwardly toward said open end, means for guiding tubing to and from said reel member, and electrical interconnection means extending into said central bearing mount and connected to said tubing, said electrical connection means including an electrical conductor coiled about the outside of said central bearing mount.

4,360,716

AREA ACTUATED SWITCH ARRAY

Charles M. Fiorella, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1980, Ser. No. 193,214
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A **11 Claims**



1. An area actuated switch array comprising:

(a) two insulating sheets overlying one another such that one side of each sheet faces one another,

(b) at least two sets of conductors on said one side of each sheet, each set comprising a plurality of evenly spaced, parallel extending conductors, the conductors of one set intersecting the conductors of a second set forming a plurality of surfaces on the insulating sheets defined by the intersecting conductors, the surfaces on one sheet being of

the same size and being alignable with the surfaces on the other sheet,

(c) a raised insulator spacer point positioned on said one side at least one sheet in each surface defined by the intersecting conductors

the raised spacer points adhesively attached to the other sheet,

whereby when pressure is applied to any portion of said sheets, said spaced conductors are pressed together to form an electrical contact.

4,360,717

ANTITHEFT DEVICE FOR MOTOR VEHICLES COMPRISING AN IGNITION AND STARTING SWITCH

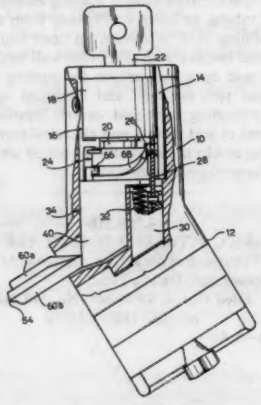
Guiseppe Maiocco, Rivoli, Italy, assignor to Arman S.p.A., Druento, Italy

Filed May 27, 1980, Ser. No. 153,679

Claims priority, application Italy, Jun. 15, 1979, 68285 A/79

Int. Cl.³ H01H *21/18, 15/00, 27/00*

U.S. Cl. 200—11 C 7 Claims



1. A motor vehicle power switch assembly operable by a key-actuated cylinder which is rotatable between a first position and a second position, said assembly comprising:

a starter having a first fixed contact for connection with a power source and a plurality of second fixed contacts for connection with motor vehicle circuits to be energized by said power source;

a housing;

a slider positioned between said stator and an inner wall of said housing, said slider being movable axially with respect to said stator between a first position and a second position, said slider, when operatively connected to the key actuated cylinder, being moved from the first to the second position when the cylinder is rotated from the first position to the second position;

a plurality of conductive rollers carried by said slider, each of said rollers being positioned so that it is moved into alignment to make an electrical connection between said first fixed contact and an associated one of said second fixed contacts as said slider moves from its first to its second position; and

means resiliently urging each of said rollers toward said stator and, when aligned with one of said second fixed contacts toward an electrical connection between one of said second fixed contacts and said first fixed contact.

4,360,718

SWITCHING MECHANISM FOR FLUID-OPERATED GEAR SHIFTERS

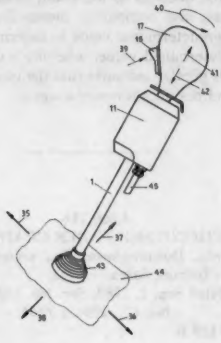
Alfred Schobinger; Günter Schwarz, and Willy Beig, all of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 10, 1980, Ser. No. 185,884

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937140

Int. Cl.³ H01H *9/06*

U.S. Cl. 200—61.88 9 Claims



1. In an automotive vehicle having traction wheels driven from an engine via a transmission provided with electrically controllable fluid-operated gear-shifting means, said vehicle being further provided with a fluid-operated working implement powered by the engine,

the combination therewith of a switching mechanism for the control of said implement and said gear-shifting means comprising:

a lever universally jointed on a base for selective pivotal motion into any of a plurality of implement-controlling positions;

a housing rigid with said lever;

a knob above said base having a stem journaled in said housing for selective rotation into a plurality of transmission-controlling angular positions relative to said lever; and

a plurality of microswitches in said housing actuatable by cam means on said stem to close different control circuits for said gear-shifting means in said angular positions.

4,360,719

STEP SWITCH

Gottfried Alsch, Vienna, Austria, assignor to Hubert Laurenz Naimer, Ascona, Switzerland

Filed Oct. 6, 1980, Ser. No. 194,075

Claims priority, application Austria, Oct. 17, 1979, 6763/79

Int. Cl.³ H01H *19/24*

U.S. Cl. 200—65 6 Claims

1. A rotary switch having a housing containing:

(a) a rotatable driving shaft;

(b) a coaxial driven switching shaft;

(c) a driving coupling part keyed to the driving shaft;

(d) a driven coupling part keyed to the switching shaft;

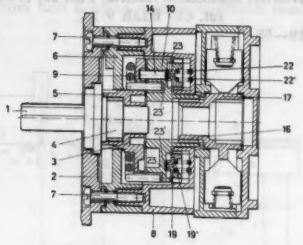
(e) a spring having two ends respectively engaging the coupling parts holding the coupling parts under tension and coupling the shafts keyed to the coupling parts together for indexing the rotary movement of the switching shaft in response to the rotation of the driving shaft; and

(f) a blocking device, means whereby said blocking device is controlled by the rotary position of the shafts in relation to each other for respectively blocking and unblocking the rotary movement of the driven coupling part and the

switching shaft keyed thereto, the blocking device including

(1) a set of bosses projecting axially from the surface of the driven coupling part,

(2) a ratchet wheel arranged non-rotatably and guided in the housing, the ratchet wheel having a set of bosses



projecting axially towards the bosses on the driven coupling part for cooperating engagement therewith, the bosses having inclined surfaces and the inclined surfaces of the bosses of one set rising gently in a direction opposite to that of the inclined surfaces of the bosses of the other set; and

(3) spring means for axially biasing the ratchet wheel.

4,360,720

STEP SWITCH

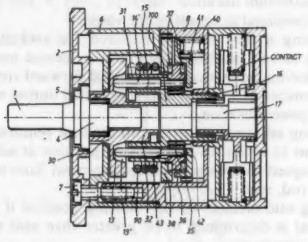
Gottfried Alsch, Vienna, Austria, assignor to Hubert Laurenz Naimer, Ascona, Switzerland

Filed Jan. 23, 1981, Ser. No. 228,172

Claims priority, application Austria, Jan. 23, 1980, 355/80

Int. Cl.³ H01H *5/16*

U.S. Cl. 200—65 **6 Claims**



1. A switch comprising a switch shaft for rotation of contact actuating means between switch positions, a drive shaft connected to the switch shaft by means of a coupling having input and output parts in the form of coaxial, spaced discs to which are attached on the adjacent faces hollow cylindrical skirts coaxial with the discs part of the length of one skirt lying within the other skirt, the outer skirt having one or more openings with radial walls and the inner skirt having a recess in register with each opening wherein the switch mechanism is at rest and the switch further comprising a coil spring which lies coaxial with and outside the skirts and has ends each formed so as to pass radially through an opening in the outer skirt and into a registering recess in the inner skirt, the spring being under tension in the rest position with the spring ends engaging ends of the recesses and openings, which tension is increased by relative rotation of the two discs and skirts, the output part of the coupling being blocked and released for rotation by a blocking device.

4,360,721

PUSH BUTTON SWITCH WITH ALTERNATE ACTION MECHANISM

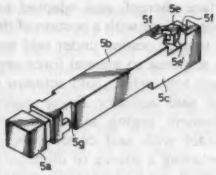
Akira Niinuma, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 234,902

Claims priority, application Japan, Mar. 5, 1980, 55-28626[U]

Int. Cl.³ H01H *13/56*

U.S. Cl. 200—153 J **2 Claims**



1. In a push button switch with an alternate action mechanism comprising a manipulation rod having a slide block mounting a slide and provided with a heart cam formed in the upper surface thereof, a case having a plurality of terminals fixed thereto and adapted to slidably support said slide block, and a substantially Z-shaped driving pin pivotally supported at its one end by said case and adapted to move at its other end along said heart cam, whereby, as said manipulation rod is depressed, said slide block is slid to change the electric connection between said terminals, and said manipulation rod is locked in the depressed state by a cooperation of between said driving pin and said heart cam,

an improvement which comprises that the lateral wall of the heart cam groove constituting said heart cam in said slide block extending in the logitudinal direction of said manipulation rod is formed by the inner peripheral surface of said case.

4,360,722

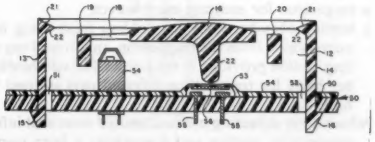
DESIGNATION CAP ACTUATOR ASSEMBLY

Thomas Georgopulos, Roselle, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Nov. 3, 1980, Ser. No. 202,979

Int. Cl.³ H01H *9/18*

U.S. Cl. 200—314 **5 Claims**



1. A designation cap actuator adapted to cooperate with circuit closing means, said circuit closing means including a circuit board having conductors thereon, a resilient dome contact element in spaced apart relationship to said conductors and adapted to make contact with said conductors upon the application of a force thereon, said circuit board further including a pair of slots extending through said circuit board each on an opposite side of said dome switch element, said designation cap actuator comprising:

an actuator housing having at least two horizontally oriented walls situated on opposite ends of the top periphery of said housing and defining an opening therebetween, said housing further including a pair of legs each leg including locking means and each of said locking means inserted into a different one of said slots interlockingly engaging said housing to said circuit board about said dome contact element;

a cantilevered actuator situated internally within said housing and including top and bottom surfaces, said actuator further including a hinge section for integrally connecting the actuator to said housing and allowing said actuator to deflect downward when manual pressure is applied to said top surface and return to its original position when manual pressure is relieved, said bottom surface including a finger extending from said bottom surface in juxtaposition to said dome contact element; and

a designation insert arranged to accept identifying indicia on a top surface thereof, and adapted to install over said actuator top surface with a portion of the perimeter of said insert top surface resting under said housing walls;

whereby, in response to manual force applied to said designation insert top surface, said actuator is deflected downward, and said actuator finger contacting said dome contact element urging said dome contact element to make contact with said conductors; said circuit board further including a source of illumination and said hinge section including an opening situated in direct alignment with said source of illumination allowing said source of illumination to be visible when said housing is installed on said circuit board.

4,360,723

MICROWAVE OVEN

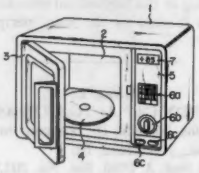
Norisuke Fukuda, Tokyo, and Leo Mori, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 23, 1980, Ser. No. 200,032

Claims priority, application Japan, Oct. 31, 1979, 54-140671; Jun. 30, 1980, 55-88806

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **16 Claims**



1. A microwave oven comprising:

a magnetron for emitting microwaves;

a heating chamber body for holding food being heated by microwaves from the magnetron, an infrared ray transmitting section provided in the top wall of said heating chamber body for transmitting infrared rays emitted from the food;

infrared ray detecting means disposed over said infrared ray transmitting section and comprising a horn member and an infrared ray detecting element, said horn member being made of material capable of cutting off microwaves and having a hollow extending toward said heating chamber body into which infrared rays are applied from the food and said infrared ray detecting element being so positioned as to detect infrared rays condensed by said hollow, said hollow having a diameter increasing toward said heating chamber body and a minimum opening size smaller than the wavelength of microwaves and having a spread angle so set that only infrared rays emitted from the food may be allowed to reach said infrared ray detecting element and that infrared rays emitted from other regions than said food may be returned after repreated reflection within said hollow without being applied to said infrared ray detecting element; and

a processing circuit for calculating the temperature of said food on the basis of a detection signal from said infrared ray detecting means.

4,360,724

METHOD AND AN APPARATUS FOR STEPWISE MOVEMENT OF A REINFORCEMENT GRID

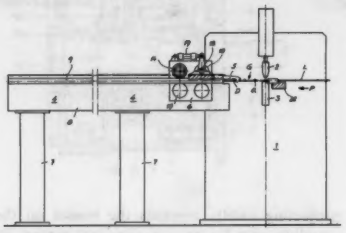
Klaus Ritter; Rudolf Scherr; Gerhard Ritter, and Josef Ritter, all of Graz, Austria, assignors to EVG Entwicklungs-und Verwertungs Gesellschaft m.b.H, Graz, Austria

Filed Feb. 13, 1980, Ser. No. 121,267

Claims priority, application Austria, Feb. 20, 1979, 1312/79

Int. Cl.³ B23K *9/1 2*

U.S. Cl. 219—58 **13 Claims**



1. In a method of moving a grid forward longitudinally in stepwise fashion, with a pause between each step, through a multi-spot welding machine, said grid comprising a plurality of longitudinal rods and a plurality of transverse rods welded thereto in said welding machine, at selected spacings, said machine including an element adapted

to engage one of said transverse rods at a starting position,

to move thereafter said grid in a forward direction through a number of steps and pauses at a first mean speed,

to be disengaged subsequently from said trasnverse rod, and following the disengagement from said transverse rod

to return to said starting position in an opposite direction at a second mean speed higher than said first mean speed,

each step in the forward direction including a movement at a forward speed, followed by a pause having a duration up to a maximum duration

the improvement comprising the steps of

establishing a time interval required for said element to return to said starting position at a second mean speed after having advanced an additional forward step beyond said number of steps, and having rested during said maximum pause duration,

comparing said time interval with the time required for said element to return to said starting position at said second mean speed following the disengagement from said transverse rod, and

returning said element to said starting position if said time interval is determined to be greater than said maximum pause duration.

4,360,725

OVERTEMPERATURE PROTECTOR FOR AN ELECTRICALLY HEATED APPLIANCE

Roger V. Eeckhout, Warminster, Pa., assignor to SCM Corporation, New York, N.Y.

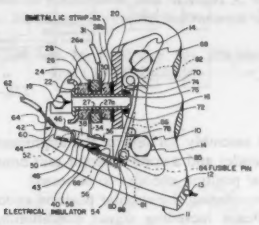
Filed Mar. 6, 1980, Ser. No. 127,683

Int. Cl.³ H05B *1/02;* H01H *37/76*

U.S. Cl. 219—253 **19 Claims**

1. In an electrical appliance having a heating element, an overtemperature protector comprising a contact-bearing member and a resilient blade having thereon a further contact, one of said member and said blade being adapted to be connected to a source of electrical power and the other being adapted to be connected in circuit with the heating element of the appliance; a thermally conductive support adapted to be in thermal communication with the heating element, means on said support holding the member and the blade in electrically insulated relationship, said further contact being fastened to the blade in

opposed, spaced relationship with said first-mentioned contact and settable into a normal current-carrying engagement with the first-mentioned contact by stressing the blade toward the first-mentioned contact; a torsion spring mounted on said support and having a fixed arm abutting said support and a mobile arm, said mobile arm being movable from a rest position clear of the blade to a flexed position with the end of said mobile arm immediately adjacent the blade at a point thereon remote from said holding means; electrical insulator means



intervening between said point on the blade and the end of the mobile arm; said end of the mobile arm being effective to engage the blade through said intervening insulator means, thereby holding said contacts in current-carrying engagement when the blade is stressed and in response to moving the mobile arm to said flexed position; and a thermally fusible pin affixed in heat exchange relationship to the support and blocking the mobile arm in the flexed position, whereby excessive heating of said pin allows the torsion spring to shear the pin and release the blade to open said contacts.

4,360,726

ELECTRIC KETTLE

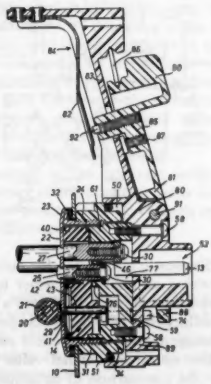
Denis H. Haden, Chestall, near Rugeley, England, assignor to D. H. Haden Limited, United Kingdom

Filed Jun. 27, 1980, Ser. No. 173,503

Claims priority, application United Kingdom, Aug. 15, 1979, 7928416; Jun. 5, 1980, 8018507

Int. Cl.³ F27D *11/02*

U.S. Cl. 219—441 **14 Claims**



1. In an electric kettle comprising a kettle body for holding liquid with an electrical immersion heater and switching means mounted thereon; wherein the immersion heater comprises a metal sheated element permanently mounted on a metal head so as to produce a hot spot on the head, wherein the switching means comprises a set of electrical switch contacts, a dry overload responsive actuating mechanism responsive to overheating of the hot spot to open the set of switch contacts and a steam responsive actuating mechanism; and wherein the set of switch contacts, electrical connectors connected to the element and electrical connectors for receiving an electricity supply are all mounted on an electrical insulating mounting, the combination comprising:

(a) the set of switch contacts comprises a first contact movable in a first direction to open the set of contacts, and a second contact movable in the opposite direction to open the set of contacts;

(b) the dry overload responsive actuating mechanism is disposed between the mounting and the head so that a bimetal device of the dry overload mechanism abuts the hot spot, and includes a first movable member which extends from the bimetal device to the first contact;

(c) the insulating mounting supports a second movable member which extends from the second contact through a way within the mounting to the steam responsive actuating mechanism for actuation by the latter;

(d) the set of switch contacts and the electrical connectors connected to the element are secured to one side of the mounting, which one side confronts the dry overload responsive actuating mechanism including a thermal insulating member; and

(e) the thermal insulating member and the insulating mounting are shaped to define a switch contact chamber therebetween, in which chamber the set of contacts are disposed; and

(f) the movable members extend into said chamber from opposite directions.

4,360,727

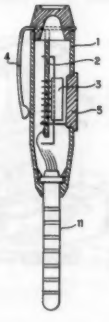
PAYMENT VOUCHER

Roger Lehmann, Paris, France, assignor to Compagnie Generale d'Automatise Societe Anonyme dite, Paris, France

Filed Apr. 9, 1981, Ser. No. 252,547

Int. Cl.³ G06K *19/06*

U.S. Cl. 235—441 **3 Claims**

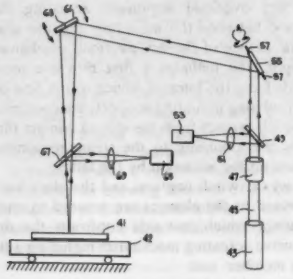


1. A payment voucher including a hollow body, an integrated circuit housed in said hollow body, said integrated circuit constituting a memory, said hollow body further including an end which bears contacts designed to co-operate with a read-and-debit machine, said contacts being connected inside the hollow body to corresponding contacts of the integrated circuit, a cover providing access to the integrated circuit from outside the body, the improvement wherein an internal security device is connected to said cover which prevents normal use of the payment voucher in the event said cover is opened.

4,360,728
BANKING CARD FOR AUTOMATIC TELLER MACHINES AND THE LIKE

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Filed Feb. 27, 1981, Ser. No. 238,832
Int. Cl.³ G01D *15/02*; G11B *23/30*; G06K *5/00*
U.S. Cl. 235—462 14 Claims

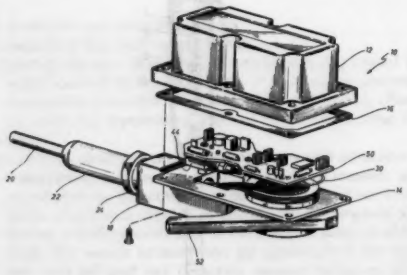


1. A data card for use with a card reader-writer comprising,
a wallet size card having opposed sides and a length equal to or exceeding a width,
a first strip of high resolution reflective direct-read-after-write laser recording material adhered to the card, the reflectivity of said first strip greater than 15%, said first strip being laser recordable in place on said card, and
a second strip of magnetic recording material adhered to the card.

4,360,729
SEISMIC CABLE CONNECTOR WITH OPTICAL TRANSCEIVER

Donald W. Harvey, Missouri City, and Donald J. Bacha, Houston, both of Tex., assignors to Geosource Inc., Houston, Tex.

Filed Nov. 17, 1980, Ser. No. 207,635
Int. Cl.³ G01V *1/22*
U.S. Cl. 250—227 9 Claims

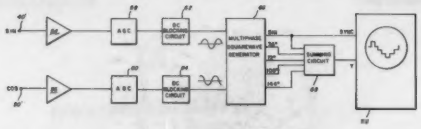


1. A fiber optic cable connector for use with a dual fiber cable in a seismic exploration system, comprising:
a digital, logic compatible optical transceiver including an optical detector connected to one fiber of the cable and a fiber optic transmitter connected to the second fiber;
an environmentally sealed case for housing the digital transceiver, the case having means for receiving one end of the fiber optic cable;
means for connecting the optical fibers to the digital transceiver; and
means for electrically connecting the transceiver in the seismic exploration system.

4,360,730
ENCODER ALIGNMENT METHOD AND APPARATUS

Donald H. Breslow, Framingham, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 16, 1980, Ser. No. 197,646
Int. Cl.³ G01D *5/36*
U.S. Cl. 250—231 SE 11 Claims

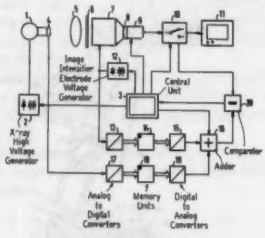


1. A test assembly for testing the alignment of an angular position encoder and a code detector unit comprising:
an angular position encoder to be tested;
means for rotating the angular position encoder;
circuit means including signal conditioning circuitry for receiving at least two outputs from the angular encoder, those outputs having a predetermined phase relationship when the encoder and detector are aligned, the circuitry including means for removing the DC offset from each of the signals and for balancing the amplitudes of the signals with respect to each other; and
display means for receiving the conditioned signals and providing a display indicative of the phase relationship of the condition signals.

4,360,731
X-RAY DIAGNOSTIC INSTALLATION

Manfred Fink, and Joerg Haendle, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 227,943
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006774
Int. Cl.³ H04N *7/18*
U.S. Cl. 378—42 7 Claims



1. An x-ray diagnostic installation for radiography and fluoroscopy, comprising an image intensifier television chain including an x-ray image intensifier (7), and a control circuit for the automatic influencing of at least one parameter determining the x-ray image quality, said control circuit comprising a radiation sensitive sensor, a nominal value transmitter, and a comparator for the comparison of an adjusted setpoint value with an actual value generated by the sensor, the improvement comprising format responsive means (13, 17) for the formation of electric signals corresponding to the image format, memory means (14, 18) coupled with said format responsive means and being responsive to the value of electric signals therefrom to supply an output signal in accordance with the dependency of parameters of the x-ray image intensifier (7) upon the image format, and said control circuit including adder means (16) coupled with said memory means (14, 18) for receiving the

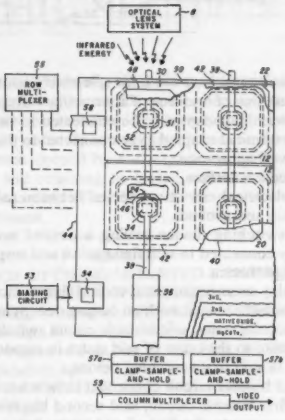
output signal therefrom and for superimposing the same on the signal from the nominal value transmitter, thereby to adjust the setpoint value supplied to said comparator in accordance with the image format.

4,360,732

INFRARED CHARGE TRANSFER DEVICE (CTD) SYSTEM

Richard A. Chapman, Dallas; Adam J. Lewis, Jr.; Jaroslav Hynecek, both of Richardson, and Michael A. Kinch, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 16, 1980, Ser. No. 159,990
Int. Cl.³ H01J *31/49*
U.S. Cl. 250—332 **12 Claims**



1. An infrared imaging system including an optical means for focusing infrared energy emanating from a scene comprising:

(a) an MIS detector matrix for receiving the focused infrared energy in the field-of-view of the optical means and converting such energy into electrical signals representative of the impinging infrared energy, said detector matrix including a plurality of detecting cells formed on the infrared sensing semiconductor material, each cell having an integrate well formed by an MIS electrode for collecting charges generated by the impinging infrared energy, a transfer MIS gate for selectively transferring the charge from the integrate well, and drain means common to selected cells to drain the charge out of the integrate wells responsive to said transfer gate; and

(b) means connected to the integrate wells for measuring voltage difference of the integrate wells with and without the charges and processing video signals representative of the voltage differences.

4,360,733

WINDOW ASSEMBLY FOR A DEEP WELL SCINTILLATION DETECTOR

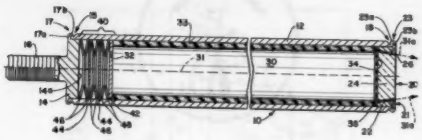
William P. Novak, Middlefield; Ival Toepke, Newbury, and John White, Chagrin Falls, all of Ohio, assignors to Bicron Corporation, Newbury, Ohio

Filed Sep. 8, 1980, Ser. No. 185,292
Int. Cl.³ G01T *1/20*
U.S. Cl. 250—361 R **10 Claims**

1. A scintillation detector window assembly for hermetically closing one end of a tubular case housing a cylindrical scintillation crystal coaxial with the case, comprising:

a window retaining ring having an inner diameter surface defining a tapered smooth-wall bore;

a window generally transparent to light generated by the crystal under bombardment from ionizing radiation, the window being in the form of a shallow, truncated cone nested within the tapered bore of the retaining ring, the window having circular faces parallel to each other, one face having a diameter larger than the other, the peripheries of the faces being separated by an edge wall surface equidistantly spaced at all points from the inner diameter surface defining the tapered smooth-wall bore of the retaining ring, the diameter of the one face being greater than the smallest diameter of the tapered smooth-wall bore; and



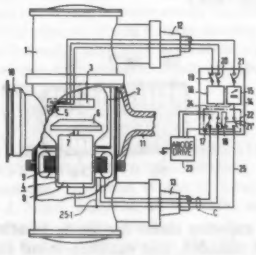
a heat-resistant epoxy adhesive composition filling at least an annular portion of the space between the edge wall surface of the window and the inner diameter surface of the tapered smooth-wall bore to hermetically bond and seal the window to the retaining ring.

4,360,734

METHOD AND APPARATUS FOR THE OPERATION OF ROTARY ANODE X-RAY TUBES

Kurt Dietz, Erlangen, and Rudolf Friedel, Kleinseebach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 254,060
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1980, 3016376
Int. Cl.³ H05G *1/66*; H01J *35/10*
U.S. Cl. 378—93 **6 Claims**



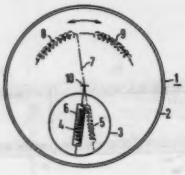
1. A method for the operation of a rotary anode x-ray tube whose anode is driven by means of a motor, between the rotor and stator of which the wall of the tube envelope is disposed, whereby, pursuant to application of a drive voltage to the stator, the rotor is brought to the desired rotational frequency, and that then, subsequent to disconnection of the drive voltage from the stator, the tube voltage, necessary for beam generation, is applied between the anode and cathode, said method further comprising connecting the rotor (8) and the stator (9) substantially to anode potential during the application of the anode voltage to the anode.

4,360,735

X-RAY TUBE COMPRISING TWO CATHODE COILS

Gerd Seifert, Spardorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 6, 1981, Ser. No. 232,194
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008304
Int. Cl.³ H05G *1/10, 1/00;* H01J *35/00, 35/04*
U.S. Cl. 378—134 3 Claims



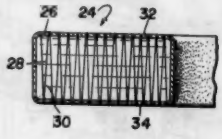
1. An x-ray tube comprising two cathode coils selectively, operable for generating the x-radiation, a housing comprised of shielding material which surrounds the cathode coils, said housing providing a path for the purpose of transmitting the stream of electrons from the active one of said cathode coils, the housing (2, 3) having a single opening (6), and means (7, 8, 9) for generating a relative movement between the housing (2, 3) and the cathode coils (4, 5), by means of which one of the cathode coils (4, 5) is selectively capable of being covered by the shielding material, while the other of the cathode coils (4, 5) is in alignment with said single opening.

4,360,736

RADIATION SHIELD

John A. Weissenfluh, 13212 Ridge Dr., Rockville, Md. 20850

Filed Apr. 15, 1980, Ser. No. 140,526
Int. Cl.³ G21F *3/02*
U.S. Cl. 250—519.1 2 Claims



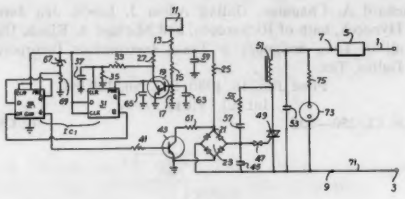
1. In a radiation shield for use in installations containing sources of radiation, said radiation shield comprising a container formed of thin flexible material composed of woven or knitted threads, the improvement wherein said radiation shield further comprises means connecting opposing walls of said container to maintain the distance therebetween when said container is filled with a radiation attenuating liquid, said means being sufficiently flexible to permit opposing walls of said container to approach each other for storage when said container is not filled with a radiation attenuating liquid, said means comprising drop stitches, said drop stitches comprising an intersecting grid of threads which extend between said opposing walls and are interlaced with the threads which compose said opposing walls.

4,360,737

TOUCH SENSITIVE SWITCH

Howard S. Leopold, Plainview, N.Y., assignor to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,172
Int. Cl.³ H01H *35/00*
U.S. Cl. 307—116 5 Claims



1. A touch sensitive switch for selectively connecting a load to the phase line of a source of alternating voltage comprising:
a load terminal adapted to be connected to said load,
a phase terminal adapted to be connected to the phase line of said voltage source,
a conductive surface,
a first electrical circuit connected between said conductive surface and ground,
a first switching device having a control terminal operatively connected to said first circuit and responsive to the voltage therein,
time delay means connected to said first switching device,
a first bistable circuit with an output occupying one of first and second states, said bistable circuit switching from said one state to the other of said states in response to current flow in said first switching device,
a second bistable circuit connected between said first circuit and first bistable circuit, said second bistable circuit having two inputs, the first of said inputs being directly connected to said first switching device and the second of said inputs being connected to said time delay means for receiving a signal conducted by said first switching device after said signal is received at said first input, said second bistable circuit applying to said first bistable circuit a signal pulse of predetermined width in response to current flow in said first circuit, said first bistable circuit switching from said one state to said other state in response to application of said pulse,
a second switching device adapted to be connected between said phase terminal and load terminal and having a control terminal, said second switching device being normally rendered nonconducting until an actuating voltage exceeding a threshold magnitude is applied to said control terminal, and
voltage applicator means responsive to said first bistable circuit for applying said actuating voltage to said control terminal of said second switching device only when said first bistable circuit is switched to said second state.

4,360,738

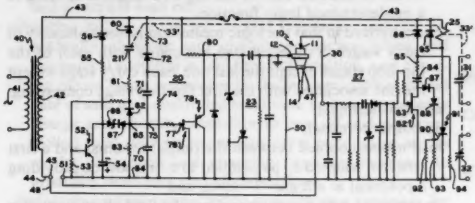
SINGLE PROBE LOW WATER CONTROL

James I. Bartels, Hudson, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 4, 1981, Ser. No. 260,232
Int. Cl.³ G08B *21/00;* G01F *23/00*
U.S. Cl. 307—118 9 Claims

1. A single probe low water cutoff and makeup water control, including: probe means having a first probe element adapted to normally be in contact with water in a boiler; said probe means further having a second probe element adapted to mount said probe means in a wall of said boiler; power supply means connected to said probe means to apply an electric potential between said elements; amplifier means connected to

said probe means to detect the presence or absence of water between said probe elements by measuring the presence or absence of a current flow through the boiler water caused by said potential; said amplifier means including switching means having normally open circuit means and normally closed circuit means when water is absent from said boiler; said normally open circuit means adapted to control fuel burner means for



said boiler and said normally closed circuit means adapted to control makeup water means for said boiler; and time delay means responsive to said amplifier means to initiate a time delay upon said normally closed circuit means closing after once having been opened by a change in water level at said probe means, and retaining its closed state for a fixed time delay period regardless of a subsequent change in water level at said probe means.

4,360,739

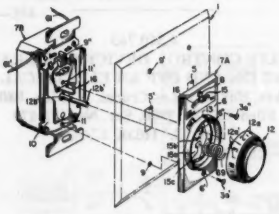
WALL SWITCH OPENING MOUNTED POWER CIRCUIT TIMER-CONTROLLER

Richard Goldstein, Northbrook, Ill., assignor to Dynascan Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 22,453, Mar. 21, 1979. This application Apr. 6, 1981, Ser. No. 251,174

Int. Cl.³ H01H *9/02, 9/16, 43/04*

U.S. Cl. 307—132 E **28 Claims**



1. Power control apparatus comprising: a rear sub-assembly to be mounted in a wall switch opening which usually includes a toggle on-off switch unit with a forwardly projecting operating arm therefor; a front sub-assembly to be mounted over a cover plate to extend over said wall switch opening and having a vertical slot designed to receive said toggle switch arm and a pair of screw-receiving openings on opposite sides of said slot; said front sub-assembly having key-forming means permanently extending from the rear thereof and passable through one of said screw-receiving openings in said cover plate acting as a keying aperture and being rendered thereby unusable as a screw-receiving means; first fastener-receiving means on said rear sub-assembly positioned to be accessible from the front of said front sub-assembly through said cover plate slot from the front of said front sub-assembly; first fastener means for engaging said first fastener receiving means for anchoring said front sub-assembly and cover plate to said rear sub-assembly through said cover plate slot; circuitry in said rear sub-assembly; said circuitry including controlled means operable to different power controlling conditions, and control means for controlling the operation of said controlled means; manually operable means which extends from said rear sub-assembly and is extendable through said cover plate slot and the front sub-assembly for controlling said control means; and a manually engageable means on the front of said manually operable means.

4,360,740

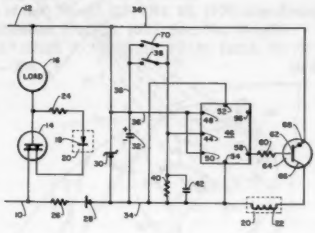
LOW VOLTAGE SWITCHING CIRCUIT FOR CONTROLLING A HIGH VOLTAGE ELECTRICAL LOAD

Albert F. Conard, 22495 Eloise Dr., El Toro, Calif. 92630

Filed Sep. 1, 1981, Ser. No. 298,318

Int. Cl.³ H02P *13/16;* **H03K** *17/72*

U.S. Cl. 307—134 **24 Claims**



1. In an electrical circuit for controlling a high voltage electrical load by a low voltage switching circuit; the combination of: a high voltage alternating current power source; solid state high voltage electronic switching means and a high voltage load to be energized connected in series across said alternating current power source, said electronic switching means transmitting high voltage electrical power therethrough to energize said high voltage load when energized and interrupting said high voltage electrical power therethrough to de-energize said high voltage load when de-energized; relay means having contacts operably connected to said electronic switching means energizing said switching means when closed and de-energizing said switching means when open, a low voltage coil causing closing of said contacts when energized and opening of said contacts when de-energized; diode means for converting said alternating current power source to direct current power source and solid state voltage limiting and storage means for reducing and storing the now direct current power, said diode means and said voltage limiting and storage means being connected in series across said alternating current power source; low voltage switching means and said low voltage coil of said relay means connected in series across said low voltage direct current power source of said voltage limiting and storage means for selectively energizing and de-energizing said low voltage coil of said relay means to selectively energize and de-energize said high voltage load.

4,360,741

COMBINED ANTENNA-RECTIFIER ARRAYS FOR POWER DISTRIBUTION SYSTEMS

George W. Fitzsimmons, Lynnwood; Walter W. Lund, Jr., Seattle, and Ervin J. Nalos, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

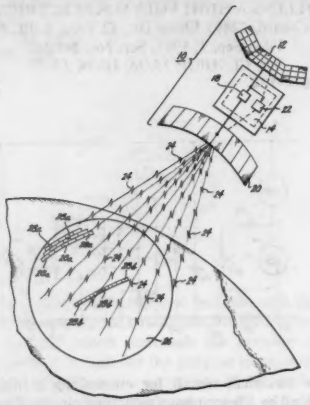
Filed Oct. 6, 1980, Ser. No. 194,123

Int. Cl.³ H02M *7/00*

U.S. Cl. 307—151 **18 Claims**

1. Apparatus for receiving electromagnetic energy and converting said electromagnetic energy to a DC signal wherein said electromagnetic energy irradiates a substantial spatial region and wherein the power density is nonuniform relative to said irradiated spatial region, said apparatus comprising a plurality of antenna-rectifier modules, each of said antenna-rectifier modules including a semiconductor rectifier that exhibits a nonlinear RF-DC rectification efficiency relative to the power level at which said semiconductor rectifier is operated, each of said antenna-rectifier modules further including a plurality of antenna elements connected for supplying an elec-

trical signal to said semiconductor rectifier when the associated antenna-receiver module is positioned within said irradiated region for receiving said electromagnetic energy, the number of said antennas within each of said antenna-rectifier modules establishing the receiving aperture of that particular antenna-rectifier module to operate said semiconductor rectifier within that particular module at a preselected power level



and efficiency, said plurality of antenna-rectifier modules being arrayed within at least a portion of said irradiated region with said receiving aperture of each said antenna-rectifier module being established in view of the power density of said electromagnetic energy at the location of that particular antenna-rectifier module to maintain said operation of said semiconductor rectifier at said desired power level.

4,360,742

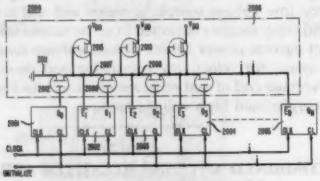
SYNCHRONOUS BINARY-COUNTER AND PROGRAMMABLE RATE DIVIDER CIRCUIT

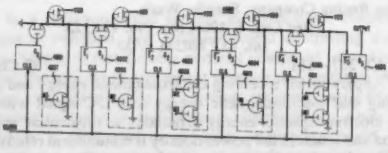
Ronald L. Freyman, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 4, 1980, Ser. No. 175,054

Int. Cl.³ H03K *21/36, 21/34, 23/22*

U.S. Cl. 307—224 C **4 Claims**





1. A synchronous counter/divider circuit comprising a plurality of ordered flip-flop stages including a first, second and last stage, each flip-flop stage having output means for providing an output signal representing the logic state of the flip-flop stage and clock input means for receiving clock pulses, each flip-flop stage except the first one having enable means and being enabled to toggle when an enable signal at a logic "0" level is applied to the enable means, the first flip-flop stage being adapted to toggle;

means for applying a sequence of clock pulses to the clock input means of each flip-flop stage; and

logic means responsive to the output signal from each flip-flop stage for providing an enable signal to the enable means of selected ones of the flip-flop stages according to a predetermined logic function,

characterized in that the logic means comprises a plurality of carry stages, a different one associated with each of the flip-flop stages except the last one, each carry stage except the one associated with the first flip-flop stage comprising:

an input terminal;

an output terminal;

load means coupled between the output terminal and a first terminal adapted to be coupled to a first source providing a potential at a logic "1" level; and

transmission gate means consisting of a field effect transistor of a first channel conductivity type having a conduction channel coupled in series between the input terminal and the output terminal and a gate electrode coupled to the output means of the associated flip-flop stage, the field effect transistor being responsive to a logic "1" level at the gate electrode for providing a relatively low resistance path across the conduction channel, the input terminal of each carry stage except the one associated with the first flip-flop stage being coupled to the enable means of the associated flip-flop stage, the input terminal of the carry stage associated with the first flip-flop stage being coupled to a second terminal adapted to be coupled to a second source providing a potential at logic "0" level, the output terminal of each carry stage being coupled to the enable means of the succeeding flip-flop stage, and whereby each carry stage is responsive to a logic "1" level output signal from the associated flip-flop stage for passing a logic "0" level enable signal to the enable means of the succeeding flip-flop stage.

4,360,743

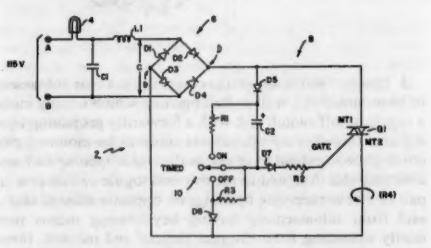
SOLID STATE CONTROL DEVICE FOR GRADUALLY TURNING ON AND OFF AN ELECTRICAL LOAD

John H. Stokes, Box 513, Las Cruces, N. Mex. 88001

Filed Jul. 23, 1980, Ser. No. 171,479

Int. Cl.³ H03K *17/72*

U.S. Cl. 307—252 B **10 Claims**



1. A solid state control device for gradually actuating and deactuating an electrical load such as a light bulb, said solid state control device being connected to AC power supply means for supplying AC power to said electrical load, said solid state control device comprising:

a gate controlled solid state switch having a gate and two main terminals coupled in series with said electrical load, said gate controlled solid state switch turning said electrical load on and off in accordance with the on and off condition of said gate controlled solid state switch;

a charging capacitor coupled between said gate and one of

said two main terminals of said gate controlled solid state switch, said charging capacitor causing said gate controlled solid state switch to turn off when charged and to turn on when discharged;

a mechanical switch coupled to said charging capacitor and having at least two positions, an on position for turning said electrical load on and a timed off position for turning said electrical load off;

charging means connected to said charging capacitor for gradually charging said charging capacitor when said mechanical switch is in said timed off position, said charging means being responsive to the leakage current in said gate of said gate controlled solid state switch to gradually charge said charging capacitor to turn off said gate controlled solid state switch at increasing conduction angles as the charge on said charging capacitor increases to gradually deactuate said electrical load;

discharging means connected to said charging capacitor for gradually discharging said charging capacitor when said mechanical switch is in said on position to turn on said gate controlled solid state switch at decreasing conduction angles as the charge on said charging capacitor decreases to gradually actuate said electrical load; and

a full wave rectifier connected to said electrical load, said two main terminals of said gate controlled solid state switch being connected across said full wave rectifier to short circuit said full wave rectifier when said gate controlled solid state switch is turned on.

4,360,744

SEMICONDUCTOR SWITCHING CIRCUITS

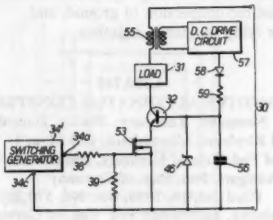
Brian E. Taylor, 169 Fambridge Rd., Maldon, Essex, England (CM9 GBU)

Filed May 27, 1980, Ser. No. 153,005

Claims priority, application United Kingdom, Jun. 1, 1979, 7919139

Int. Cl.³ H03K *3/26, 17/60*

U.S. Cl. 307—254 **6 Claims**



1. A semiconductor switching circuit, comprising

(a) a voltage source (**30**);

(b) a load (**31**);

(c) switching means operable in response to switching control signals applied thereto for connecting said load across said voltage source, said switching means including

(1) first (**32**) and second (**53**) semiconductor switching devices connected in series for switching current through said load, said switching devices being arranged to switch together in response to said switching control signals;

(2) said second switching device having a predetermined voltage rating;

(3) said first switching device including a switchable path and a control terminal for controlling the switchable path;

(d) means (**55**) for providing a current-responsive signal that is a function of the current flowing through said load;

(e) a D.C. drive circuit (**57**) responsive to said current-responsive signal for providing to the control terminal of said first switching device a D.C. drive signal that is dependent on the load current; and

(f) voltage limiting means (**46**) for limiting the voltage across said second switching device so as not to exceed the voltage rating thereof, and for removed stored charge in said first switching device, thereby to increase the switching speed of said circuit.

4,360,745

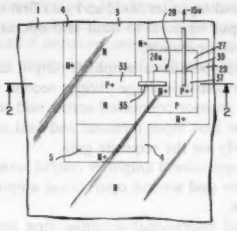
DEPLETION CAPACITANCE COMPENSATOR

Paul R. Prince, Fountain Valley, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 83,425, Oct. 10, 1979, abandoned. This application May 26, 1981, Ser. No. 266,699

Int. Cl.³ H03K *3/353;* **G11C** *19/28;* **H01L** *29/78*

U.S. Cl. 307—304 **10 Claims**



1. A charge coupled device formed on a semiconductive layer of a first conductivity type having a charge flow channel adapted for transfer therethrough of charge packets, having depletion capacitance compensation, comprising:

a compensating diode formed in or near said layer adjacent to said channel, including a first conductivity type portion and a second conductivity type portion;

a charge storage region of said second conductivity type formed in said channel adapted for storage of a charge packet therein;

a conductor connected directly between said charge storage region and said first conductivity type portion of said compensating diode; and

means for maintaining a reverse bias potential across said first and second conductivity type portions of said compensating diode.

4,360,746

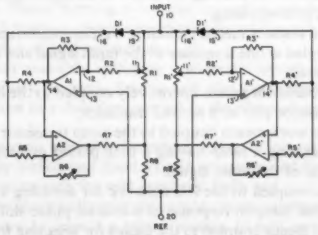
DIODE AND VARISTOR SIMULATOR

Carl B. Branson, Glendale Heights, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Nov. 3, 1980, Ser. No. 202,987

Int. Cl.³ H03K *5/08*

U.S. Cl. 307—494 **3 Claims**



1. A two terminal varistor simulator circuit having an input

and a reference terminal comprising a first and a second diode simulator circuit each further comprising:

a resistive voltage divider having a first end terminal connected to said input terminal and a second end terminal and an adjustable tap terminal,

a first and a second operational amplifier each having a first and a second input means and an output means,

a first resistor having a first and a second terminal,

means connecting said resistive voltage divider tap terminal to said first input means of said first operational amplifier operating in an inverting mode to thereby select a voltage reference, and said second end terminal to said first resistor first terminal,

said first operational amplifier second terminal and said first resistor second terminal connected to said reference terminal,

a diode and a second resistor connected in series and between said input terminal and said first operational amplifier output terminal to limit said operational amplifier to half wave operation,

said second operational amplifier output terminal connected to said resistive voltage divider second terminal,

a variable resistor connected across said second operational amplifier first input terminal and said output terminal to adjustably set the requisite gain,

said first operational amplifier output terminal further connected to said second operational amplifier second input terminal,

said second operational amplifier first input terminal connected to the junction of said diode and second resistor placing said second operational amplifier inputs across said second resistor to thereby respond to the current flow of said first operational amplifier.

4,360,747

VOLTAGE CONTROLLED SUBCARRIER PHASE SHIFTER

John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 9, 1980, Ser. No. 185,459

Int. Cl.³ H03K *5/153*; G01R *25/04*

U.S. Cl. 307—511 **10 Claims**

1. A circuit for shifting the phase of an input signal of given frequency, comprising;

input transistor means including a differential transistor pair coupled at one transistor to the input signal and responsive thereto;

ramp transistor means operatively coupled to the differential transistor pair at a second transistor;

RC network means coupled to the ramp transistor means for generating a ramp having a time period greater than one cycle of the input signal;

means coupled to the RC network for selecting a threshold on the ramp in response to a desired phase shift; and

output means coupled to the means for selecting for generating oscillations at said given frequency in response to the selected threshold level to define a shifted output signal.

4,360,748

POLYPHASE STATOR SYSTEM FOR A LINEAR MOTOR

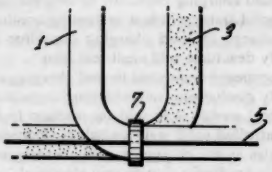
Hans-Georg Raschbichler, Ottobrunn, and Otto Breitenbach, Nuremberg, both of Fed. Rep. of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshütte AG, Hanover and Thyssen Industrie Aktiengesellschaft, Essen, both of, Fed. Rep. of Germany

Filed Feb. 18, 1981, Ser. No. 235,550

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006382

Int. Cl.³ H02K *41/02*

U.S. Cl. 310—13 **7 Claims**



1. A polyphase a.c. winding for a linear motor, comprising in combination

a plurality of cables, each one arranged in a meandering pattern, the cables being arranged to overlap and to establish a plurality of parallely extending cable portions, wherein spaced-apart but adjacent portions pertain to different ones of the cables, the parallel portions being provided for placement into respectively parallel extending stator core grooves;

the cables each having at least one semiconductive shielding layer, at least a portion of the layer of each cable being exposed;

at least one bare wire being strung along the pattern, off said parallel portions, and being in contact-making engagement with said shielding layers of said cables, said wire provided for connection to ground; and

means for tying the cables together.

4,360,749

AUTOMOTIVE ALTERNATOR CONSTRUCTION

Karl-Heinz Neumann, Leonberg; Walter Hagenlocher, Stuttgart; Karl Kleebaur, Allmersbach, and Klaus H. Christ, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,281

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933568

Int. Cl.³ H02K *15/00*

U.S. Cl. 310—42 **12 Claims**

1. Automotive alternator adapted for attachment to an automotive engine

a housing (**11**);

means (**12, 13**) for securing the housing, and hence the alternator, to the engine;

a stator (**19, 21**) seated in the housing;

a rotor including a rotor shaft (**18**), an electromagnetic structure (**26, 27, 28, 29**), a drive pulley (**24**) and a sheet metal ventilating or fan wheel (**23**) secured to the shaft and rotatable concentrically within the stator;

bearings (**16, 17**) seated in the housing and journaling the rotor,

wherein

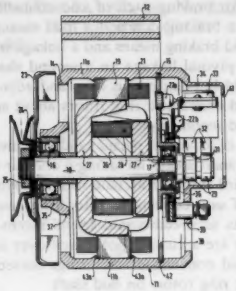
the housing comprises a pair of essentially half-cylindrical half-shells (**11*a*, 11*b***) which are separated along a separation plane which is parallel to the axis of the shaft (**18**);

the separating plane passes through the axis of rotation of the shaft (**18**),

means (**35, 36, 42, 43*a*, 43*b***) formed inside of said half shells,

forming the housing for locating said stator and said bearings in predetermined position in the respective half-shells;

the securing means comprises at least one holding bracket attached to one of the half shells; and wherein



the rotor shaft (18), bearings (16, 17), the drive pulley, the sheet-metal ventilating fan wheel and the electromagnetic structure (26-29) form a single subassembly fitted, with the stator surrounding the subassembly, within a half-shell for subsequent assembly of the other half-shell thereover.

4,360,750

ROTOR FOR AN ELECTRICAL MACHINE

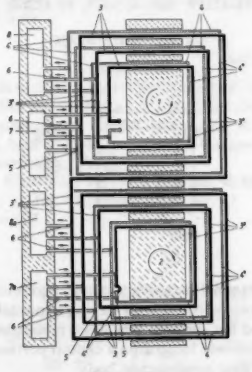
Herbert Pohl, Hausen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 24, 1980, Ser. No. 171,831

Claims priority, application Switzerland, Jul. 26, 1979, 6905/79

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—54 **8 Claims**



1. In a rotor device for an electrical machine having a liquid-cooled winding including at least one winding layer, said at least one winding layer including a plurality of conductors positioned in a plurality of slots in said rotor and a plurality of end turns located at an end of said rotor, each of said plurality of end turns coupling two of said plurality of conductors across said end of said rotor, the improvement comprising:

a plurality of electrically conductive connector means for coupling liquid to said at least one winding layer, one of said plurality of connector means being associated with each of said plurality of end turns, each of said plurality of connector means including a liquid passageway therein, each of said plurality of connector means acting as one of a liquid supply connector and a liquid return connector;

a plurality of liquid chambers associated with said connector means; and

a plurality of insulated liquid coupling means for coupling said plurality of liquid chambers to said plurality of connector means, each of said plurality of coupling means coupling one of said plurality of liquid chambers to one of said plurality of connector means;

wherein each of said plurality of end turns are located equally distant from an axis of rotation of said rotor on all sides of said rotor, each of said plurality of connector means being spaced about a circle concentric with said axis of rotation; and

wherein each of said plurality of connector means includes a shank portion including a liquid passageway therein, each shank portion extending out of the plane formed by said associated end turn axially into the direction of said associated chambers, and each said shank portion forming a liquid connection between one of said plurality of insulated coupling means and one of said plurality of connector means.

4,360,751

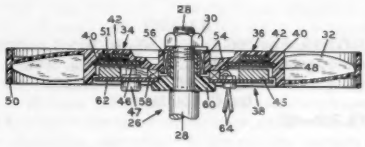
FAN WITH INTEGRAL DISC-SHAPED DRIVE

Frank Arnold, Jr., Locust Valley, and Dana F. Geiger, Great Neck, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jun. 6, 1980, Ser. No. 157,069

Int. Cl.³ H02K *1/28*

U.S. Cl. 310—60 R **10 Claims**



1. An integral fan and D.C. printed circuit electric motor drive assembly comprising:

a stator assembly;

an armature assembly having planar windings;

mounting means for mounting said assemblies for rotating one of said assemblies in a planar path past the other of said assemblies;

said rotating one of said assemblies including integral therewith and extending circumferentially therearound a set of fan blades;

said fan blades forming a housing extending axially of the axis of rotation of said one of said assemblies and housing the other of said assemblies;

said stator assembly including a magnetic circuit assembly directing a magnetic field to said planar windings of said armature in a direction normal to the plane of said armature;

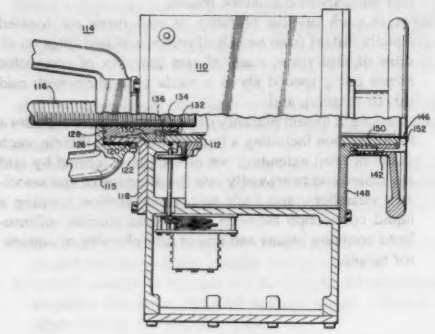
said armature assembly including a ring of magnetic tape spirally coiled and fixed to said armature and forming a flux return path for said magnetic field; and

means for electrically energizing said planar windings of said armature to impart a rotary motion to said one of said assemblies past the other of said assemblies and to said fan blades integral therewith.

4,360,752
NUTATING MOTOR GATE VALVE OPERATOR AND ROTOR ASSEMBLY

William L. Morgan, Seattle, Wash., assignor to Morgan Actuators, Inc., Seattle, Wash.

Filed Mar. 10, 1980, Ser. No. 128,653
Int. Cl.³ H02K 7/06
U.S. Cl. 310—82 7 Claims



1. A valve operator, driven by a nutating motor having a hollow output shaft, comprising:

said motor being located centrally of said valve operator and having said hollow output shaft rotatable about an axis;

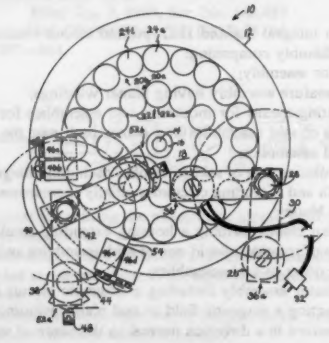
a linearly movable valve stem coaxially aligned with the hollow output shaft, said valve stem and hollow output shaft adapted to coaxially interfit; and

coupling means between the hollow output shaft and the valve stem for converting the rotary motion of the hollow output shaft to linear motion of the valve stem.

4,360,753
MOTOR HAVING CONCENTRIC RING ROTOR

E. Paul Shannon, Rte. 2, Box 249, Killen, Ala. 35645

Filed May 8, 1980, Ser. No. 147,855
Int. Cl.³ H02K 49/00
U.S. Cl. 310—93 8 Claims



1. Motor including a concentric ring rotor for use in a vehicle or other like mechanical, electrical or electromechanical structure, comprising:

a. a rotor support axially and rotatably mounted on a first shaft, said first shaft secured to a frame means;

b. a plurality of concentric ring rotors increasing from a smaller diameter to a larger diameter, a rotor support plate supporting each of said rotors, said plurality of rotors aligned on and stacked on said first shaft;

c. a plurality of magnetic domains of alternating magnetic poles on each of said concentric ring rotors in increasing diameters, said plurality of magnetic domains including a plurality of members of magnetic material;

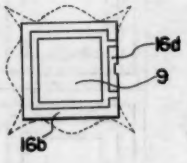
d. a means for braking each of said concentric ring rotors including a braking coil and a load means connected to each of said braking means and a linkage means including a one-bar pivotal linkage on a second shaft axially positioning said braking means over and adjacent to at least one of said concentric ring rotors about an arcuate position of said second shaft; and,

e. a plurality of drive coil means axially aligned and mounted on a third shaft means including a one-bar pivotal linkage on said third shaft for arcuate rotation over and adjacent to each of said concentric rotor rings, said second and third shafts secured to said frame means whereby said drive coils are arcuately positioned over and adjacent to each of said concentric rotor rings thereby driving said concentric ring rotors on said shaft.

4,360,754
MODE SUPPRESSED PIEZOELECTRIC DEVICE

Isao Toyoshima, and Eizo Ohtsuka, both of Kanazawa, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 21, 1979, Ser. No. 105,903
Claims priority, application Japan, Dec. 27, 1978, 53-163021; Jun. 4, 1979, 54-42259; Jun. 4, 1979, 54-42260; Jun. 4, 1979, 54-42261
Int. Cl.³ H01L 41/08
U.S. Cl. 310—366 12 Claims



1. A three terminal piezoelectric unit, comprising:

(a) a planar piezoelectric body having oppositely facing first and second flat surfaces which are rectangular in shape;

(b) a first electrode located on a central portion of said first surface of said piezoelectric body;

(c) a second electrode located on the entire said second surface of said piezoelectric body;

(d) a rim electrode surrounding said first electrode and located adjacent all edges of said first surface except one central portion of one side edge of said first surface;

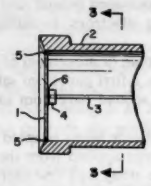
(e) an extended electrode located on said one central portion of one side edge of said first surface in a spaced relation to both said first electrode and said rim electrode;

(f) a runner electrode electrically connecting said second electrode with said extended electrode such that when said piezoelectric unit is excited and vibrated primarily in the breathing mode, spurious harmonic vibrations are dampened.

4,360,755
ANODE MOUNTING FOR WINDOW TYPE GEIGER-MUELLER TUBE

Stephen Levy, Ocean City, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 31, 1980, Ser. No. 221,953
Int. Cl.³ H01J 47/00
U.S. Cl. 313—93 1 Claim

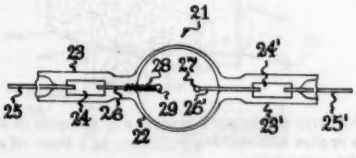


1. A Geiger-Mueller tube with which a geiger discharge is produced comprising:
a tubular cylindrical metal cathode,
an elongated metal anode coaxially disposed within said cathode along the longitudinal axis of said cathode,
a gaseous medium disposed in the space between said cathode and said anode,
one end of the cathod being mechanically sealed to the anode using an electrical insulating means between the anode and the cathode,
a radiation-permeable window sealed across the other end of said cathode, the anode being terminated a short distance from the window without any seal,
the improvement including a ceramic cup which has a flat surface at one end and a cup-like hole formed with an opening at the other end, with said glass frit flat surface sealed onto the center portion of the mica window which remains intact, and the anode being captured within said cup-like hole.

4,360,756
METAL HALIDE LAMP CONTAINING THI_4 WITH ADDED ELEMENTAL CADMIUM OR ZINC

John E. Spencer, South Euclid, and Ashok K. Bhattacharya, Lyndhurst, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,899
Int. Cl.³ H01J 17/20, 61/22
U.S. Cl. 313—179 1 Claim

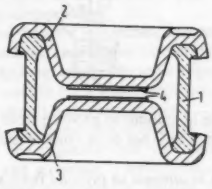


1. A high intensity metal halide arc discharge lamp comprising an envelope of fused silica,
inleads sealed into said envelope and electrically connected to electrodes positioned to define an arc gap therein, at least one of said electrodes serving as cathode comprising a tungsten portion on which thorium may deposit and be continually renewed by a transport cycle involving iodine, said thorium serving as an electron emitter allowing said cathode to achieve the electron emission required for the current through said lamp at a lower temperature,
a discharge sustaining filling in said envelope provided by inserting therein at manufacture a charge comprising mercury, NaI, ScI_3, ThI_4 and an inert starting gas,
and a getter in said envelope selected from the metals Cd, Zn, or mixtures thereof, the quantity of said getter being at least sufficient to provide the stoichiometric equivalent M′ of any iodine released in said envelope as a result of impurities picked up during manufacture plus the stoichiometric equivalent M″ of the iodine resulting from decomposition of the ThI_4 in said charge, and the quantity of said getter not exceeding approximately three times the stoichiometric equivalents M′ plus M″.

4,360,757
ELECTRODE ACTIVATING COMPOUND FOR GAS DISCHARGE TUBE

Axel Hahndorff, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 11, 1980, Ser. No. 129,244
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914836
Int. Cl.³ H01J 61/06, 17/04
U.S. Cl. 313—218 15 Claims



1. A material for use in forming an electrode activating compound for a gas discharge tube, said compound consisting of a metal oxide of a metal from the fourth subgroup of the periodic table, said metal oxide being a titanium oxide having a valence lower than quadrivalent titanium oxide, said material being applied on an electrode before processing of the electrode and including a constituent selected from a group consisting of titanium and titanium hydride, said constituent during processing of the electrode being partially oxidized by an oxygen-containing atmosphere to produce the titanium oxide with a valence lower than quadrivalent titanium oxide.

4,360,758
HIGH-INTENSITY-DISCHARGE LAMP OF THE MERCURY-METAL HALIDE TYPE WHICH EFFICIENTLY ILLUMINATES OBJECTS WITH EXCELLENT COLOR APPEARANCE

William A. Thornton, Jr., Cranford; Daniel A. Larson, Cedar Groove, and Edward Chen, Glen Rock, all of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1981, Ser. No. 228,039
Int. Cl.³ H01J 61/18, 61/48
U.S. Cl. 313—227 6 Claims

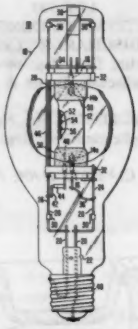
1. A high-intensity-discharge lamp which efficiently illuminates objects with excellent color appearance, said lamp comprising:
a sealed light-transmitting arc tube of predetermined dimensions and enclosing a predetermined volume;
electrodes operatively disposed within said arc tube and spaced from one another a predetermined distance to define therebetween an arc path of predetermined length, lead-in conductors sealed through said arc tube and electrically connecting to said electrodes;
a light-transmitting protective envelope surrounding said arc tube and enclosing a predetermined environment, conductor means sealed through said protective envelope,

and means electrically connecting said conductor means to said lead-in conductors;

said arc tube enclosing a small charge of inert ionizable starting gas and a discharge-sustaining filling substantially comprising:

mercury in predetermined amount as required to provide a predetermined voltage drop between said electrodes when said lamp is normally operating;

thallous iodide in amount to provide from about 0.02 mg to about 0.2 mg of TlI per cc of volume enclosed by said arc tube;



stannous iodide in amount to provide from about 0.1 mg to about 0.8 mg of SnI_2 per cc of volume enclosed by said arc tube;

calcium iodide in amount to provide from about 0.25 mg to about 2.5 mg of CaI_2 per cc of volume enclosed by said arc tube and to provide from about 1.2 mg to about 10 mg of CaI_2 per mg of said stannous iodide; and

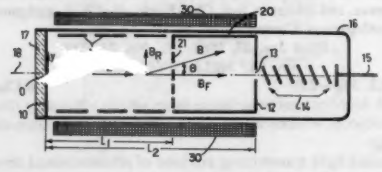
said lamp when normally operating having a predetermined power consumption, and means associated with said lamp causing the cold-spot temperature within said arc tube during normal lamp operation to be at least about 750° C.

4,360,759

IMAGE TUBE FOR PRODUCING OPTICAL IMAGES WITH HIGH RESOLUTION

Karl-Peter C. Lindblom, Ytternäsv, Nagu 21660, Finland, and Allan Danielsson, Ängsvägen 7, Sollentuna, Sweden

Filed Dec. 10, 1979, Ser. No. 101,832
Claims priority, application Finland, Sep. 5, 1979, 792752
Int. Cl.³ H01J *31/26, 40/04*
U.S. Cl. 313—381 **5 Claims**



1. An image tube for electrical measurement of optical images, comprising

a vacuum vessel with a central axis;

a window transparent to optical radiation fixed to one end of said vessel;

a photocathode positioned on the inside of said window, said photocathode emitting photoelectrons in response to optical radiation;

a metallic mesh spaced a distance L_1 from said photocathode;

a screen spaced a distance L_2 from said photocathode, said screen having an aperture for receiving electrons emitted from said photocathode;

external magnetic coils for providing a magnetic field along said electron path, said magnetic field being such that said electrons rotate a whole number n of revolutions along said path, there being from a minimum of 1 to a maximum of 3 revolutions n; and

an electron detector positioned behind said aperture in said screen for detecting electrons travelling through said aperture,

said mesh dividing the path of movement of electrons in said vessel into two parts, a first part from said photocathode to said mesh, and a second part from said mesh to said screen,

said mesh and photocathode being adapted to be energized by an electrical voltage applied from the outside of said tube so as to provide along said first part of said electron path an electrostatic field which is approximately parallel to the central axis of said tube,

said mesh and said screen being adapted to be energized at the same electrical potential, and

said distances L_1 and L_2 and said number of revolutions n being related by the mathematical relation

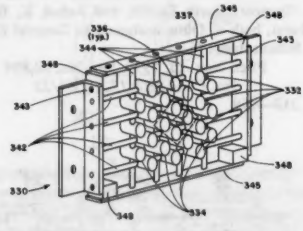
$$L_2 > L_1 \geq \left(\frac{3}{8n-3}\right) L_2.$$

4,360,760

ELECTROSTATIC QUADRUPOLE ARRAY FOR FOCUSING PARALLEL BEAMS OF CHARGED PARTICLES

John Brodowski, Smithtown, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 20, 1980, Ser. No. 179,918
Int. Cl.³ H01J *25/10*
U.S. Cl. 315—5.41 **3 Claims**



1. An array of elements forming a quadrupole of the type which applies a strong focusing force to a beam of charged particles, comprising:

(a) four substantially identical elements, each comprising an electrically conductive support rod and an electrically conductive electrode, the electrode having a longitudinal axis and a cross-sectional area orthogonal to the longitudinal axis which is greater than the cross-sectional area of the rod, the electrode being mounted on and in electrical contact with the rod with the longitudinal axis of the electrode substantially orthogonal to the axis of the rod, the electrodes having planar faces at each end orthogonal to the longitudinal axis of the electrode, and the electrodes being mounted asymmetrically on the rods;

(b) means for positioning the electrodes in a substantially

square array to form a quadrupole with the axes of the electrodes being substantially parallel, the faces of the electrodes being aligned in two planes orthogonal to the longitudinal axes of the electrodes, the rods connected to one pair of opposite electrodes forming a first parallel pair and the rods connected to the other pair of opposite electrodes forming a second parallel pair, the first pair of rods being substantially orthogonal to the second pair and spaced from the second pair due to asymmetrical mounting of the electrodes, the rods being so positioned that no rod will obstruct the passage of a beam through the volume, defined by the quadrupole, wherein the beam may be exposed to strong focusing forces and so that a plan view of the array taken orthogonally to the longitudinal axes of the electrodes would show the sides of the square formed by said electrodes being at an angle of approximately 45 degrees with the rods, the positioning means further comprising:

(b1) an insulator; and

(b2) first and second conductive terminals, each terminal having two ends, the terminals being electrically and mechanically connected to the first and second pairs of rods respectively and being mechanically joined but electrically insulated at one end by the insulator, whereby the elements are held in position to form the quadrupoles and each of the pairs of opposite electrodes may be connected to sources of electrical potential so that they have opposite polarity.

4,360,761

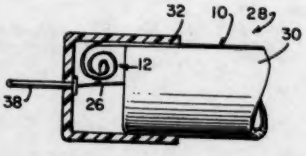
FLUORESCENT LAMP STARTING AID HAVING AN INTEGRAL COUPLING IMPEDANCE

William J. Roche, Merrimac, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 25, 1980, Ser. No. 181,300

Int. Cl.³ H01J *61/56, 61/42*

U.S. Cl. 315—60 **3 Claims**



1. A starting aid for a fluorescent lamp, said starting aid comprising a tripartite structure including in sequence a flexible electrically insulating strip; a metalized layer on said strip; and a first adhesive layer on said metalized layer; and an integral impedance connector coupling one end of said starting aid to a base pin of said lamp, said impedance connector comprising, in sequence, a second strip of flexible electrically insulating material attached to said first adhesive layer at a position remote from the bulb of said fluorescent lamp; a second adhesive layer; and a strip of metal foil adhered to said second adhesive layer.

4,360,762

RAPID STARTER SWITCH FOR A FLUORESCENT LAMP

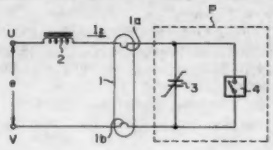
Seiichiro Yamamoto; Hiromi Adachi, both of Kamakura, and Shoichi Iwaya, Kisagata, all of Japan, assignors to TDK Electronics Co., Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,986

Claims priority, application Japan, Dec. 21, 1979, 54-177599[U]; Dec. 21, 1979, 54-177600[U]

Int. Cl.³ H05B *39/00*

U.S. Cl. 315—101 **18 Claims**



1. A rapid starter switch for a fluorescent lamp to be connected in series with a ballast, and a pair of filaments of a fluorescent lamp comprising:

(a) a connector cap for connecting electrically the present starter switch to an external circuit and supporting the same, and said cap being able to be engaged with a socket for a glow switch for a fluorescent lamp,

(b) a printed circuit board suspending a non-linear capacitor having the non-linear characteristics between a voltage applied to the capacitor and the charge stored in the capacitor, and mounting a semiconductor switching circuit connected substantially parallel to that non-linear capacitor, said non-linear capacitor being suspended by a pair of lead lines for absorbing vibration of the non-linear capacitor on said printed circuit board,

(c) a pair of lead lines for providing the electrical coupling between said printed circuit board and said cap, and for supporting said printed circuit board, and

(d) a casing coupled to said cap and covering said printed circuit board and said lead lines.

4,360,763

METHOD AND DEVICE FOR CONTROL OF GREAT CURRENTS PARTICULARLY OF THE PULSE TYPE

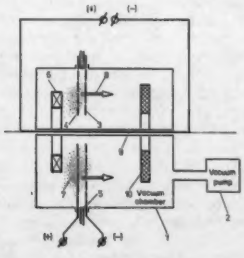
Michal Gryzinski, Warsaw, Poland, assignor to Instytut Badan Jadrowych, Warsaw, Poland

Filed Feb. 27, 1980, Ser. No. 125,210

Claims priority, application Poland, Mar. 13, 1979, 214086

Int. Cl.³ H01J *7/24*

U.S. Cl. 315—111.01 **7 Claims**



1. A method of controlling strong currents, in an apparatus including an electric circuit with two electrodes spaced at a

distance from each other, comprising the steps of: creating a region of gas between the electrodes, and varying the density of the gas so as to obtain a constant value of the ratio of: the gas pressure, multiplied by the square of the medium distance between the electrodes, and divided by the intensity of the magnetic field produced by current flow in said electric circuit, to thereby remove ionized gas from the space between the electrodes, and producing said gas density variations by directing an additional gas stream with variable density to the space between the electrodes.

4,360,764

FLASH UNIT HAVING PLURAL FLASHLAMPS

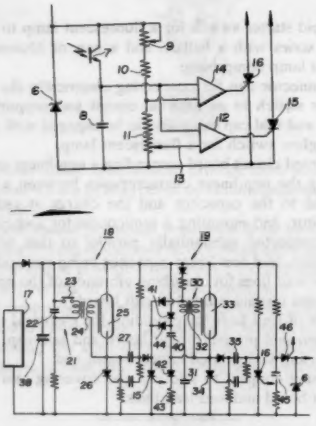
Hideo Yagi, Tokyo, Japan, assignor to Kabushiki Kaisha Sunpak, Tokyo, Japan

Filed Oct. 16, 1980, Ser. No. 197,473

Claims priority, application Japan, Oct. 26, 1979, 54-137581; Mar. 14, 1980, 55-31550; Apr. 5, 1980, 55-46008[U]; May 30, 1980, 55-73995[U]

Int. Cl.³ H05B *41/34*

U.S. Cl. 315—151 11 Claims



1. An electronic flash unit for operation in response to an applied trigger signal to illuminate a certain region, comprising: a trigger signal input, a first flashlamp and at least one additional flashlamp for illuminating said certain region, photometric means operative after application of a trigger signal at said input for developing at least two photometric output signals corresponding to light reflected from said certain region, one of said photometric output signals being developed in response to one integrated value of light and another of said photometric output signals being developed in response to another and higher integrated value of light, current supply means, and circuit means for applying currents from said current supply means to said flashlamps, said circuit means including first triggering means coupled to said photometric means for initiating operation of said first flashlamp in response to said one of said photometric output signals, second triggering means coupled to said trigger signal input for initiating operation of said additional flashlamp in response to a trigger signal applied at said input and at a time prior to triggering of said first flashlamp, first terminating means coupled to said photometric means for terminating application of current to said first flashlamp in response to said another of said photometric output signals, and second terminating means coupled to said photometric means for terminating application of current to said additional flashlamp in response to said one of said photometric output signals, said first flashlamp being thereby operative after said additional flashlamp and said first terminating means being thereby operative to terminate application of current to said first flashlamp in response to said another and higher integrated value of light reflected from said region after application of said trigger signal.

4,360,765

CONTROL CIRCUIT FOR A GLOW PLUG ASSEMBLY SERVING AS AN ENGINE PREHEATING MEANS

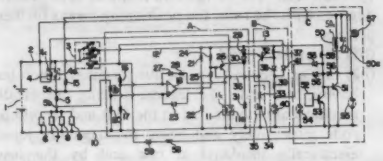
Yutaka Kubota, Kawagoe, and Hitoshi Sugimoto, Higashimatsuyama, both of Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 237,994

Claims priority, application Japan, Mar. 7, 1980, 55-28894

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—209 M 3 Claims



1. A control circuit for a glow plug assembly serving as an engine preheating means, the control circuit comprising:

(a) a glow plug assembly consisting of a plurality of glow plugs,

(b) a key switch having three positions, that is, OFF, ON and START positions,

(c) a temperature sensing circuit for starting to supply a power to said glow plug assembly, when said key switch is shifted from the OFF position to the ON position, and interrupting the power thereto, when the temperature of said glow plug assembly reaches a predetermined value, and

(d) a heat retaining circuit for interposing a resistor between said glow plug assembly and a power source to lower a voltage applied to said glow plug assembly then that at the time of said preheating for heat retention, when said key switch is shifted from the START position to the ON position, and intermittently connecting said resistor to said glow plug assembly to suppress an increase in temperature of said glow plug assembly, when said key switch is shifted from the START position to the ON position.

4,360,766

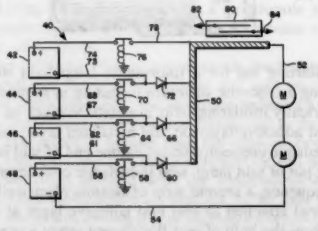
MULTI-BATTERY POWER SUPPLY FOR DC MOTORS

Carl R. Bogardus, Jr., 3224 Lamp Post La., Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 943,757, Sep. 19, 1978, abandoned. This application Jan. 7, 1981, Ser. No. 223,104

Int. Cl.³ H02P *1/00*

U.S. Cl. 318—139 9 Claims



2. A power supply circuit for successively connecting a

plurality of electrically isolated batteries in a series connection with a DC motor, comprising:

(a) a plurality of large DC batteries for providing power to a DC motor, each DC battery having two terminals including a positive and a negative terminal,

(b) a common power bus adapted to be electrically connected to a DC motor,

(c) each DC battery having a battery-adding circuit connected between one of the two terminals and the common power bus for placing the battery in series with the DC motor,

(d) each battery-adding circuit having a blocking diode directly connected to the common power bus and an electrically controllable normally-open battery-adding switch connected between the diode and one of the two terminals,

(e) a connecting line connected at one end of the battery-adding circuit between the blocking diode and the battery-adding switch, and at the other end to the terminal of the next battery to be connected in series with the DC motor which is of opposite polarity from said one of the two terminals,

(f) common electrical control means electrically connected to all of the normally open battery-adding switches of the battery-adding circuits for successively closing the battery-adding switch in the battery-adding circuit for each successive battery to be placed in series with the DC motor,

(g) the common electrical control means including a single spaced electrical switch element for each battery-adding switch,

(h) a control line connected between each electrical switch element and the battery-adding switch to which it is connected,

(i) the switch elements being positioned in spaced relationship from each other and with respect to a single operator controlled device to provide for successive closing of the battery-adding switches as desired by the operator,

(j) the control lines being interconnected electrically to keep successive earlier activated battery-adding switches closed, and

(k) all of the normally open battery-adding switches being normally open when they are not connected in circuit with the motor so that when no power is being supplied to the motor the batteries are electrically isolated from each other.

4,360,767

MOTOR SPEED CONTROL APPARATUS

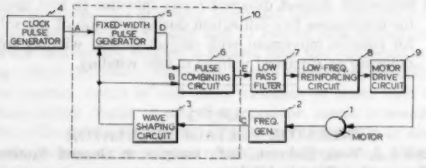
Ryo Akiyama, Sakai, and Makoto Gotou, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 7, 1980, Ser. No. 119,368

Claims priority, application Japan, Feb. 9, 1979, 54-14728; Feb. 13, 1979, 54-15729

Int. Cl.³ H02P 5/16

U.S. Cl. 318—318 **6 Claims**



1. A motor speed control apparatus comprising: a motor; a frequency generating means coupled to said motor to be controlled for generating a detective frequency output signal having a frequency proportional to the rotational speed of said motor; a clock pulse generating means for generating a stable clock pulse train; a rotational speed error detecting means for generating a rotational speed error pulse train output in response to the output signals of said frequency generating means and of said clock pulse generating means, the pulse width of said rotational speed error pulse train corresponding to the rotational speed error of said motor; a low pass filtering means, coupled to said rotational speed error detecting means, for changing said rotational speed error pulse train to a smooth voltage signal corresponding to the pulse width of said rotational speed error pulse train; a low frequency reinforcing means, coupled to said low pass filtering means and comprising an active filter whose response is −20 dB/decade at its low frequency region of operation and whose response is flat at its high frequency region of operation, for reinforcing the low frequency component included in said rotational speed error pulse train; and a motor driving means, coupled to said low frequency reinforcing means, for driving said motor, whereby said motor generates a torque corresponding to the output of said motor driving means;

wherein said rotational speed error detecting means comprises:

a detective digital pulse train generating means for generating a detective digital pulse train output in response to the output signal of said frequency generating means;

a first fixed-width pulse train generating means having a divide-by-N counter (N being an integer), which starts counting the output pulses of said clock generating means when said divide-by-N counter is triggered by an edge of a predetermined polarity of said detective digital pulse train, and which generates a first fixed-width pulse train output, the pulse width of which is equal to the counting time of said divide-by-N counter;

a second fixed-width pulse train generating means having a divide-by-M counter (M being an integer), which starts counting the output pulses of said clock generating means when said divide-by-M counter is triggered by an edge of a predetermined polarity of said first fixed-width pulse train, and which generates a second fixed-width pulse train output, the pulse width of which is equal to the counting time of said divide-by-M counter; and

a pulse combining circuit means having two input terminals, to one of which the output of said first fixed-width pulse train generating means is coupled, and to the other of which the output of said second fixed-width pulse train generating means is coupled, said pulse combining means producing a rotational speed-error pulse train by combining said output signal from said first fixed-width pulse train generating means and said output signal from said second fixed-width pulse train generating means.

4,360,768

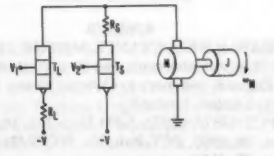
HIGH CURRENT ACCELERATION SERVOMOTOR DRIVER

Gary W. Corner, and Gary W. Jorgenson, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1979, Ser. No. 5,646

Int. Cl.³ H02P 5/16

U.S. Cl. 318—389 **2 Claims**



1. A motor control circuit for keeping a desired motor current waveform comprising:

a motor;

switch means for continuously supplying heavy current flow to said motor during an acceleration period; and

control circuit means comprising a transistor operated in the nonsaturated region connected in parallel with said switch

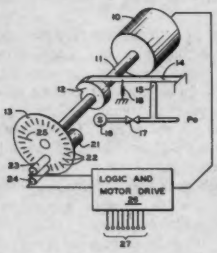
means for supplying increasing continuous current flow to said motor during said acceleration period to at least partially compensate for a drop in current flow through said switch means due to rise in back emf.

4,360,769

OPTICAL COUNTING MOTOR SHAFT POSITIONER

Fred C. Selkey, Hawthorn, and Louis S. Smulkstys, Arlington Heights, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 7, 1979, Ser. No. 73,408
Int. Cl.[3] G05B *1/03*
U.S. Cl. 318—601 18 Claims



1. A system for positioning the output shaft of a motor comprising:

terminal means for receiving a predetermined count representing a desired position for said output shaft;

counting means having a first input connected to said terminal means for receiving said predetermined count, a second input for receiving a count enable signal, and third input means;

count generating means including an optically encoded disc to be driven by said output shaft, said optically encoded disc having a reset window and a plurality of count windows, said count generating means further comprising a light source on one side of said disc and first and second photosensors on the other side of said disc, said first photosensor being operated by said reset window once per revolution of said shaft for supplying said count enable pulse to said second input of said counting means to allow said counting means to count and said second photosensor being operated by said count windows for supplying counts to said third input means of said counting means dependent upon the rotation of said output shaft; and,

switch means connected to said motor and to said counting means for energizing said motor when said counting means receives a predetermined count representing a new desired position and for de-energizing said motor when said counts supplied by said second photosensor to said third input means matches said predetermined count.

4,360,770

VARIABLE RELUCTANCE MOTOR SYSTEMS

William F. Ray, Attenborough, and Rex M. Davis, East Leake, both of England, assignors to Chloride Group Public Limited Company, London, England

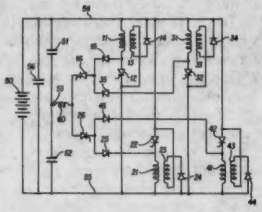
PCT No. PCT/GB79/00079, § 371 Date Jan. 10, 1980, § 102(e) Date Jan. 10, 1980, PCT Pub. No. WO79/01133, PCT Pub. Date Dec. 27, 1979
PCT Filed May 24, 1979, Ser. No. 187,837
Int. Cl.[3] H02P *5/16*
U.S. Cl. 318—701 16 Claims

1. A variable reluctance electric motor system comprising:

a variable reluctance motor having a main winding for each of a number of phases;

a power converter circuit including a main thyristor in series with each main winding of the motor across a d.v. source for sequentially supplying each main winding with unidirectional current pulses independently of the other main windings;

a commutating circuit including a capacitor for commutating the main thyristor of one phase; and



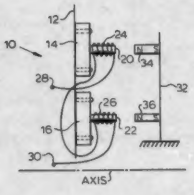
a resetting circuit arranged to resonantly reverse the charge on the said capacitor by passing a current through the motor winding of another phase.

4,360,771

ON-MACHINE BATTERY RECHARGING SYSTEM

Wesley F. Grenlund, Clinton, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 22, 1979, Ser. No. 87,412
Int. Cl.[3] H02J *7/00;* H02K *21/12, 11/00*
U.S. Cl. 320—61 10 Claims



1. In a system of the type in which a battery is mounted on a continuously rotating roll for powering electrical apparatus, the improvement therein of battery charging apparatus comprising:

a rectifier mounted on the roll and electrically connected to the battery;

coil means mounted on the roll and electrically connected to said rectifier, said coil means comprising a hollow torus mounted on the continuously rotating roll concentric with the axis of rotation of the roll and a winding carried on said torus and electrically connected to said rectifier; and

a permanent magnet disposed freely movable in said torus for continuous free-fall action during rotation of the roll for relative movement with respect to said winding for inducing an electrical voltage in said winding.

4,360,772

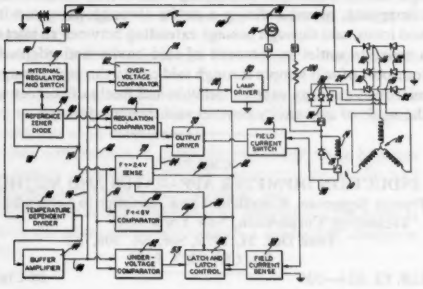
GENERATOR VOLTAGE REGULATOR

Richard J. Voss, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 49,320, Jun. 18, 1979, Pat. No. 4,277,738. This application Apr. 15, 1981, Ser. No. 254,307
Int. Cl.[3] H02J *7/24*
U.S. Cl. 322—28 2 Claims

1. A voltage regulator for a motor vehicle battery charging system that includes an alternating current generator having an output winding and a field winding, a first rectifier means connected to said output winding having direct voltage output terminals, a battery connected across said output terminals of

said first rectifier means and second rectifier means connected to said output winding having field energizing terminals providing a direct field energizing voltage comprising, transistor switching means having a collector-emitter circuit adapted to be connected in series with the field winding of said generator, first and second conductor means adapted to be connected with said field energizing terminals, first and second transistors for controlling the switching of said transistor switching means, a resistor, means connecting said resistor, the collector-emitter circuit of said first transistor and the base-emitter circuit of said transistor switching means in series and across said conductor means, means connecting the collector-emitter circuit of said second transistor in shunt with the base-emitter circuit of said transistor switching means, said first transistor when conductive providing base drive for said transistor switching means through said resistor and said second transistor when conductive bypassing the base-emitter circuit of said transistor switching means, voltage comparator means, means connecting the output of said voltage comparator means with the base electrodes of said first and second transistors such that said comparator can operate said transistors to a first state in which said first transistor is conductive and said second transistor is nonconductive or a second state in which said first transistor is nonconductive and second transistor is conductive, a



voltage sensing means adapted to be connected across the battery of the vehicle charging system, means connected to said voltage sensing means for providing a reference voltage, said sensing means providing a battery voltage that is a function of sensed battery voltage, means for applying said reference and battery voltages to said comparator means, said comparator means operative to cause said first and second transistors to assume said first state when said battery voltage is less than said reference voltage and to assume said second state when said battery voltage is greater than said reference voltage, third and fourth transistors, means connecting the collector-emitter circuit of said third transistor in shunt with the base-emitter circuit of said first transistor, means connecting the collector-emitter circuit of said fourth transistor in series with the base-emitter circuit of said second transistor, a Zener diode, and means connecting said Zener diode between one of said conductor means and the base electrodes of said third and fourth transistors, said Zener diode being adapted to conduct to thereby bias said third and fourth transistor conductive when the voltage at said field energizing terminals increases to an abnormally high value, the conduction of said third transistor biasing said first transistor nonconductive and the conduction of said fourth transistor biasing said second transistor conductive to thereby bias said transistor switching means nonconductive.

4,360,773

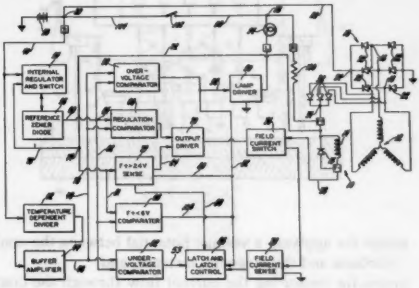
GENERATOR VOLTAGE REGULATOR

Richard J. Voss, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 49,320, Jun. 18, 1979, Pat. No. 4,277,738. This application Apr. 15, 1981, Ser. No. 254,309

Int. Cl.³ H02J *7/24*

U.S. Cl. 322—28 **1 Claim**



1. A voltage regulator for a motor vehicle battery charging system that includes an alternating current generator having an output winding and a field winding, a first rectifier means connected to said output winding having direct voltage output terminals, a battery connected across the output terminals and second rectifier means connected to said output winding having field energizing terminals adapted to provide a direct field energizing voltage comprising, a voltage sensing circuit adapted to be connected across the battery to sense battery voltage, field current control means adapted to be connected in series with the field winding of the generator and across the field energizing terminals of the second rectifier means, means coupled to said field current control means and responsive to the voltage sensed by said voltage sensing circuit for controlling the operation of said field current control means to thereby regulate the output voltage of the generator to a desired regulated value, fault detecting means adapted to be connected across the field energizing terminals of said second rectifier means operative to detect voltage excursions indicative of an open diode in said first rectifier means, low voltage detector means coupled to said voltage sensing circuit for sensing a condition of operation wherein the voltage sensed by said voltage sensing circuit is lower than desired, and means coupled to said fault detecting means and to said low voltage detector means adapted to latch a fault indicator device to a continuously conductive state during the simultaneous occurrence of a low voltage condition detected by said low voltage detector means and voltage excursions indicative of an open diode detected by said fault detecting means.

4,360,774

APPARATUS FOR MEASURING THE SURFACE INSULATION CHARACTERISTICS OF COATINGS ON MAGNETIC MATERIALS

Layton D. Crytzer, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1980, Ser. No. 137,868

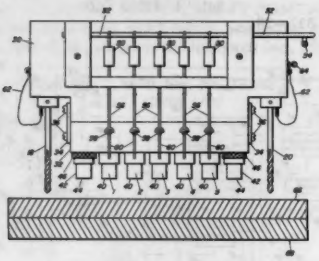
Int. Cl.³ G01R *31/16*

U.S. Cl. 324—54 **22 Claims**

1. An apparatus for measuring the surface insulation characteristics of coatings on magnetic material comprising:

an insulative button block having a plurality of protruding electrically conductive contact buttons stationarily mounted therein, with each contact button provided with a substantially flat contact surface, and with the contact surfaces lying substantially in the same plane,

means for pressing the entire button contact surfaces against the coated surface of the magnetic material, said means applies a uniform contact pressure over the entire button surface area and restrains lateral movement of the contact buttons,



means for applying a voltage potential between the contact surfaces and the magnetic material, and

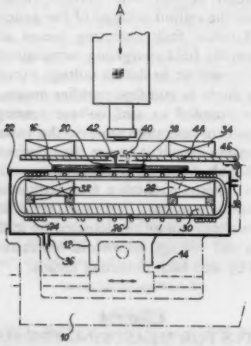
means for measuring the current flow through the coating on the magnetic material to determine the surface insulation characteristics of said coating.

4,360,775

MACHINE FOR TESTING PLANAR MAGNETIC FILM WITH MAGNETIC BUBBLES

Daniel Mauduit, Rives sur Fure, and Georges Sauron, Meylan, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 29, 1980, Ser. No. 154,145
Claims priority, application France, Jun. 1, 1979, 79 14126
Int. Cl.³ G01R *33/12*; G11C *19/08*
U.S. Cl. 324—210 **9 Claims**



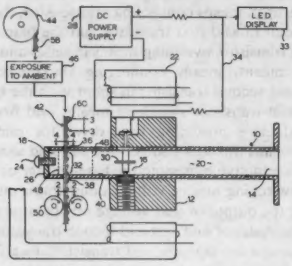
1. A machine for testing planar magnetic film with magnetic bubbles, said machine comprising support means carrying a testing device and a magnetic head, wherein the magnetic head incorporates two polarization coils and two flat coils, said polarization coils being in the Helmholtz position and having a common axis normal to the plane of the magnetic film, the axes of said flat coils being perpendicular to one another and parallel to the plane of the magnetic film, a first of the polarization coils being arranged within the flat coils which are themselves arranged one within the other and on the same side of the magnetic film, whilst the testing device and the second polarization coil are arranged on the other side of the magnetic film.

4,360,776

ESR BASED PORTABLE MICROANALYTIC APPARATUS AND METHOD

Albert J. Bauman, 524 Oakdale Dr., Sierra Madre, Calif. 91024

Filed Sep. 11, 1980, Ser. No. 186,116
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—316 **41 Claims**



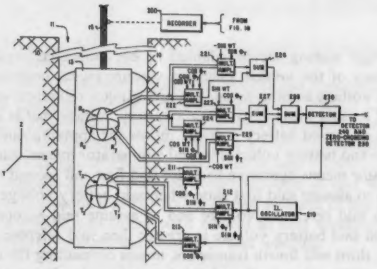
1. In an ESR spectrometer apparatus having an elongated microwave cavity providing a locus for receiving a sample to be measured for spin resonance response, a microwave energy source for said cavity, and a detector responsive to the microwave energy generated spin resonance signal of the sample in said cavity in sample identifying relation, the improvement comprising, means defining a cavity through passage within said locus, said through passage extending between an inlet and a separate outlet in the wall of said cavity and adapted to transport of said sample through said cavity through passage in microwave energy exposed relation and freely of contact with the walls of said cavity beyond said through passage.

4,360,777

INDUCTION DIPMETER APPARATUS AND METHOD

Francis Segesman, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,732
Int. Cl.³ G01V *3/28*
U.S. Cl. 324—339 **31 Claims**



29. Apparatus for determining properties of subsurface formations surrounding a borehole, comprising:

an array of transmitter coils;

an array of receiver coils;

means for individually energizing said transmitter coils;

electronic transmitter steering means for controlling said energizing means to electronically steer, in three dimensions, the direction of the magnetic moment resulting from the magnetic field components generated by said transmitter coils; and

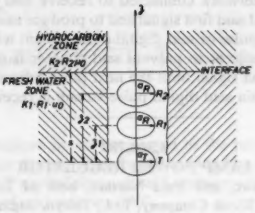
receiver processing means for processing the signals induced in said receiver coils.

4,360,778

HIGH FREQUENCY INDUCTION LOG FOR LOCATING FORMATION INTERFACES

Robert Freedman, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 955,673, Oct. 10, 1978, Pat. No. 4,278,941. This application Dec. 22, 1980, Ser. No. 219,414
Int. Cl.[3] G01V 3/28
U.S. Cl. 324—339 2 Claims



1. A method for locating an interface between two zones having substantially the same resistivity but one zone containing fresh water, the other zone containing a hydrocarbon, said method comprising:

moving an induction logging tool past said interface, said tool having at least a transmitting coil and two receiver coils spaced to one side of said transmitting coil, said transmitting coil being energized at a frequency of between 20 and 60 megahertz;

measuring both the in-phase and out-of-phase voltage at each receiver coil;

using the in-phase and out-of-phase voltages at each receiver coil to determine the phase difference between the signals received at each receiver coil;

recording with respect to depth the phase difference between the signals received at the two receiver coils as the tool approaches and passes said interface; and

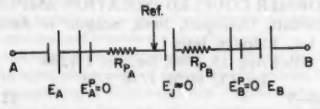
locating the depth of said interface by determining the depth at which the phase difference exhibits a substantial change in value.

4,360,779

MEASURING DEVICE FOR ELECTRICAL CELLS

Emanuel Peled, Even Yehuda, and Chaim N. Yarnitzky, Haifa, both of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Ramat-Avid, Israel

Filed Jul. 28, 1980, Ser. No. 172,656
Int. Cl.[3] G01N 27/42
U.S. Cl. 324—434 6 Claims



1. Electrochemical cell testing apparatus for testing the storage capacity of an electrochemical battery including two half-cells, which apparatus comprises:

current applying means for applying a constant current and a superimposed alternating current to said battery; and

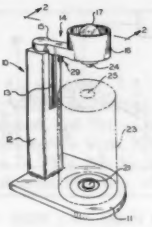
sensing means for connection with cell terminals associated with each half-cell and to the current applying means for sensing and indicating with respect to at least one half-cell over potential difference, solution resistance and solution potential difference.

4,360,780

DUAL VOLTAGE BATTERY TESTER

William G. Skutch, Jr., 2444 Edgehill Rd., Toledo, Ohio 43615

Filed Oct. 30, 1981, Ser. No. 316,751
Int. Cl.[3] G01N 27/42
U.S. Cl. 324—437 6 Claims



1. An apparatus adaptable for alternatively testing a battery shaped as a cylinder, wherein the cylindrical battery has a first pole and a second pole disposed on opposite ends of the cylinder, and a battery shaped as a rectangular parallelepiped, wherein the rectangular battery has a first pole and a second pole disposed on the same face of the parallelepiped, comprising:

a base;

means on said base for establishing electrical contact with the first pole of a cylindrical battery placed thereon;

a hollow stem connected to said base having a lower end and an upper end, said stem defining a receiving chamber in said lower end;

a plunger positioned in said receiving station in axial sliding contact with said stem;

resilient means urging said plunger toward an uppermost position;

a horizontal arm connected to an upper end of said plunger and extending over said base;

a terminal on said horizontal arm and in electrical contact therewith, said terminal including a resistive body formed of a semiconductor material having an upper metallic end and a lower metallic end, whereby said upper metallic end is in electrical contact with said horizontal arm and said lower metallic end is placed into electrical contact with the first pole of a rectangular battery when said center contact of said test lamp is placed into electrical contact with the second pole of the rectangular battery when said horizontal arm is moved downwardly;

a test lamp on said horizontal arm and in electrical contact therewith; and

means on said horizontal arm for establishing electrical contact between said terminal and a first pole of a rectangular battery placed on said base and for establishing electrical contact between a center contact of said test lamp and a second pole of a cylindrical or rectangular battery placed on said base; said base, said stem, said plunger, and said horizontal arm comprising an electrically conductive material whereby the downward movement of said horizontal arm, carried by said plunger, creates an electrical circuit between the cylindrical or rectangular battery being tested and said lamp for testing the output of the battery.

4,360,781

CIRCUIT FOR PRODUCING TIMING PULSES IN THE REGENERATION OF SQUARE SIGNALS

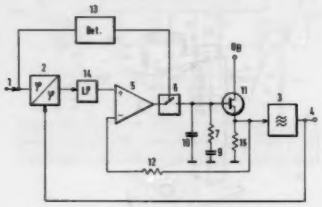
Josef Sochor, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1980, Ser. No. 216,863

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951022

Int. Cl.³ H03K *13/32*; H03L *7/00*

U.S. Cl. 328—120 **1 Claim**



1. Electrical circuit for producing a continuting timing signal, said circuit comprising timing signal input means (1), a phase comparator (2), a low pass filter (14), a variable oscillator (3), a differential amplifier (5) which is capable of operating as a current source, switching means (6) response to signal amplifier (5) upon signal drop-out, a first capacitor (10), a series of a second capacitor (9) and a first resistor (7), an impedance converter (11, 15), and a second resistor (12),

a first input of said phase comparator (2) being connected to said input means (1), a second input of said phase comparator being connected to the output (4) of said variable oscillator (3), the output of said phase comparator being connected to the input of said low pass filter (14), the output of said low pass filter (14) being connected to a first input of said differential amplifier (5), said switching means (6) being interposed between the output of said differential amplifier (5) and said impedance converter (11, 15), said first capacitance (10) and said series (7, 9) being connected across the input of said impedance converter, the output of said impedance converter (11, 15) being connected to the control input of said variable oscillator (3) and also being connected by means of said second resistor (12) to the second input of said differential amplifier (5).

4,360,782

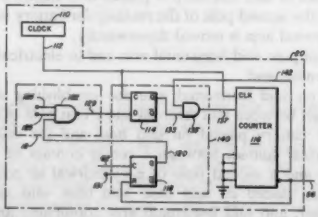
MAXIMUM FREQUENCY DETECTOR

John R. Nowell, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Sep. 26, 1980, Ser. No. 191,117

Int. Cl.³ H03K *5/26, 3/78*

U.S. Cl. 328—140 **10 Claims**



1. A maximum frequency detector for preventing the variable frequency of a digital pulse stream from exceeding a predetermined maximum frequency, comprising:

a. A digital counter producing a first signal at a particular count thereof and a second signal at said particular count in absence of a clock pulse and a third signal, said counter continuously cycling through a certain number of counts in sequence including said particular count at a rate determined by the frequency of a clock pulse unless prevented by receipt of said third signal;

b. A clock connected to provide clock pulses at a certain known frequency to said counter, said certain frequency being said certain number of counts multiplied by said predetermined maximum frequency; and

c. A logic network connected to receive said digital pulse stream and said first signal and to produce said third signal after one pulse of said digital pulse stream when said first signal is present to prevent said counter from producing said second signal until the next pulse following said one pulse within said digital pulse stream is received.

4,360,783

LAMP POWER REGULATOR

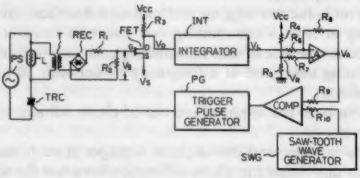
Kiyoto Nagasawa, and Yuzi Narumi, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 210,078

Claims priority, application Japan, Dec. 3, 1979, 54-156656

Int. Cl.³ H05B *39/08*; G06G *7/20*

U.S. Cl. 328—144 **5 Claims**



1. An apparatus for maintaining an electric power through a load at a predetermined power value, comprising a power source for applying an electric voltage signal to the load, sensor means for sensing an effective voltage across the load, squaring means for producing an output voltage which varies substantially in proportion to a square of said effective voltage and regulator means for varying said electric voltage signal applied to the load by the power source in such a manner that said output voltage is regulated to a predetermined voltage value which corresponds to said predetermined power value;

the squaring means comprising a field effect transistor; and

integrator means connected between the squaring means and the regulator means for producing an output signal corresponding to a squared mean value of said output voltage of the squaring means.

4,360,784

TRANSFORMER COUPLED ISOLATION AMPLIFIER

Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems, Inc., Eldridge, Iowa

Filed Aug. 13, 1980, Ser. No. 177,588

Int. Cl.³ H03F *1/34, 3/38*

U.S. Cl. 330—9 **12 Claims**

9. An isolation amplifier comprising:

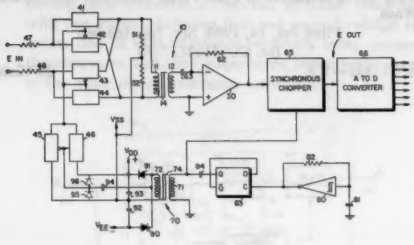
(a) two input terminals;

(b) a transformer having a primary and a secondary winding, each with first and second ends;

(c) a resistive coupling of at least 1,000 ohms between said two input terminals and the first and second ends of said primary of said transformer;

(d) a low impedance input amplifier having its input connected across the secondary winding of said transformer, said low impedance input amplifier having an effective input impedance sufficiently low that when added to the resistance of said secondary and reflected through to the

primary its value is less than about one thousandth of the value of said resistive coupling; and

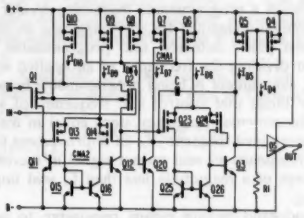


(e) a first chopper means connected to the primary of said transformer for periodically alternating the phase of the input signal applied through said resistive coupling to the two ends of said primary 180°.

4,360,785
TRANSISTOR AMPLIFIERS EXHIBITING LOW INPUT OFFSET POTENTIALS

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1980, Ser. No. 153,627
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—261 **10 Claims**



1. A current amplifier comprising:

first and second transistors of a first conductivity type, each having respective common and output electrodes defining the ends of its principal current conduction path and having a respective input electrode, wherein the potential between its common and input electrodes controls the conduction through its principal current conduction path,

an input terminal to which the output electrode of said first transistor connects;

an output terminal to which the output electrode of said second transistor connects;

a common terminal to which the common electrodes of said first and second transistors connect; and

means connecting the output electrode of said first transistor to the input electrodes of said first and second transistors for completing a direct-coupled degenerative feedback loop that adjusts the input electrode potentials of said first and second transistors respective to their common electrode potentials to condition said first transistor to conduct via its principal current conduction path at least a portion of any current applied between said common and input terminals, being improved in that the potential between the common and output electrodes of said first transistor is maintained smaller than the potential between the common and input electrodes of said first transistor, and to that end including

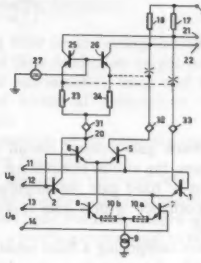
a differential-input amplifier having an inverting input connection, having a non-inverting input connection connected to said input terminal, and having an output connection connected to the input electrodes of said first and second transistors, and including

means for applying a biasing potential between the inverting input connection of said differential-input amplifier and said common terminal, said biasing potential having a magnitude no greater than the potential between the input and common electrodes of said first and second transistors.

4,360,786
VARIABLE-GAIN DIFFERENTIAL AMPLIFIER

Karl H. Rehfeldt, Quickborn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,632
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951637
Int. Cl.³ H03F *3/45*; H04N *9/535*
U.S. Cl. 330—254 **7 Claims**



1. A variable-gain differential amplifier circuit arrangement comprising:

first and second long-tailed pairs of transistors, a control input, a current source circuit for controlling said control input to which said amplifier input is coupled, said current source circuit having first and second output current paths included in the tails of said first and second said long-tailed pairs respectively and being constructed so that the currents in said output current paths will vary in mutually opposite sense in response to the application of a signal to said amplifier input, first and second d.c. load impedances included in the output elecrode circuits of one transistor of said first pair and one transistor of said second pair respectively, a gain control input coupled to the control electrodes of the transistors of said first and second pairs in such manner that the application of a gain control signal to said input will result in said one transistor of said first pair and said one transistor of said second pair being driven in the same sense and in the other transistor of said first pair and the other transistor of said second pair being driven in the opposite sense, and

means for maintaining the standing voltages at those terminals of said load impedances which are connected to the output electrodes of the one transistor of said first pair and the one transistor of said second pair respectively substantially independent of the value of said gain control signal,

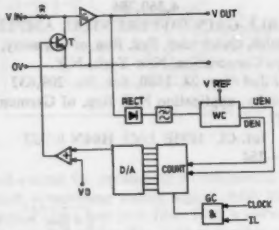
wherein said means comprises a current divider circuit to the input of which are connected to output electrodes of said other transistors of said first and second pairs, said current divider circuit having first and second outputs connected to said terminal of said first load impedance and said terminal of said second load impedance respectively.

4,360,787

DIGITALLY CONTROLLED WIDE RANCH AUTOMATIC GAIN CONTROL

Robert K. P. Galpin, Bucks, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Sep. 12, 1980, Ser. No. 186,770
Claims priority, application United Kingdom, Sep. 14, 1979, 7931951
Int. Cl.³ H03G 3/20
U.S. Cl. 330—284 2 Claims



1. In an automatic gain control circuit for use in a data transmission system, the circuit comprising:

amplifier means of fixed gain for amplifying an input data signal in accordance with a gain thereof to provide an output signal;

attenuator means comprising a fixed resistive device and an active device having a conductance which is controllable, and connected to said amplifier means for controlling the amplification of said amplifier means; and

control means responsive to an amplifier output envelope voltage of the output signal of said amplifier means for generating and providing to said attenuator means a control voltage which controls the conductance of said active device;

said control means comprising a rectifier for rectifying said output signal of said amplifier means to produce a rectified output voltage, a window comparator for comparing the rectified output voltage with upper and lower reference voltage limits, and for generating a count enable signal whenever the rectified output voltage deviates outside the upper and lower reference voltage limits, a clock providing a clock signal, a digital counter responsive to said count enable signal and to said clock signal for counting selectively in an upward or downward direction when said rectified output voltage deviates outside the upper or lower reference voltage limits, respectively, said digital counter providing a count output, and a digital-to-analog converter responsive to the count output of said digital counter to provide an analog output to said attenuator means for changing the conductance of the active device;

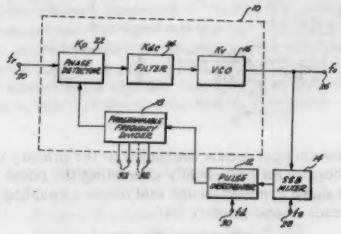
the improvement comprising means for detecting a break in transmission in the data transmission system and generating an inhibit signal, and inhibiting means connected to said clock and responsive to said inhibit signal for inhibiting the clock signals so as to stop the counting of said digital counter and freeze the conductance of said active device, and thus the gain of the automatic gain control circuit, in its state when the break in transmission occurred.

4,360,788

PHASE-LOCKED LOOP FREQUENCY SYNTHESIZER

Floyd D. Erps, Stanwood, Wash., and Raymond L. Fried, Loveland, Colo., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Jul. 14, 1980, Ser. No. 168,066
Int. Cl.³ H03L 7/18
U.S. Cl. 331—1 A 20 Claims



1. In a frequency synthesizer system of the phase-locked loop variety wherein an output signal is supplied by a first voltage controlled oscillator, said output signal having a frequency determined by an error signal supplied to said first voltage controlled oscillator by a first phase detector circuit, said first phase detector circuit being responsive to an applied signal at a predetermined frequency f_r and being responsive to a feedback signal derived from said output and having a frequency mathematically related to the frequency of said output signal, and wherein the apparatus for supplying said feedback signal includes a programmable frequency divider having an output terminal connected for supplying said feedback signal to said first phase detector, said programmable frequency divider for dividing the frequency of an applied signal by an integer N, said integer N being programmable between upper and lower limits that control said frequency of said output signal in incremental frequency steps equal in magnitude to said predetermined frequency f_r, an improvement for controlling said frequency of said output signal in incremental frequency steps of a magnitude less than f_r, said improvement comprising:

single sideband mixing means responsive to said output signal and responsive to an applied signal having a selectable frequency f_s that exceeds the cutoff frequency of said phase-locked loop, said single sideband mixing means supplying a signal having a frequency substantially equal to said frequency of said output signal offset by an amount substantially equal to said selectable frequency f_s; and,

frequency incrementing means responsive to said signal supplied by said single sideband mixing means and responsive to an applied signal having a selectable frequency f_d that exceeds the cutoff frequency of said phase-locked loop, said frequency incrementing means including means for supplying a signal at a frequency substantially equal to said frequency supplied by said single sideband mixing means offset by an amount substantially equal to said selectable frequency f_d to said programmable frequency divider.

4,360,789

VERY LOW CURRENT PIERCE OSCILLATOR

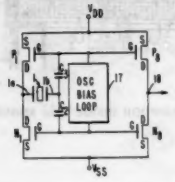
Lanny L. Lewyn, Laguna Beach, and Charles H. Lucas, Newport Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 17, 1980, Ser. No. 169,554
Int. Cl.³ H03B 5/36
U.S. Cl. 331—109 15 Claims

1. An oscillator having regulated source-to-drain current oscillation amplitude, comprising:

a passive resonator having two terminals;

a first complementary pair of transistors comprising a first and a second conductivity type transistor, each comprising a gate, a source, a drain and a channel, said transistors having their channels connected in series combination with one another between first and second voltage references, one of said resonator terminals being connected therebetween, and their gates being individually coupled to the other of said resonator terminals;



means for applying a voltage to the gate of one transistor of said first transistor pair, said applying means responsive to an increase in the oscillation of the source-to-drain current of the other transistor of said first transistor pair for reducing the source-to-drain current of said one transistor by changing said applied gate voltage.

4,360,790

VARACTOR CONTROLLED PUSH-PULL OSCILLATOR

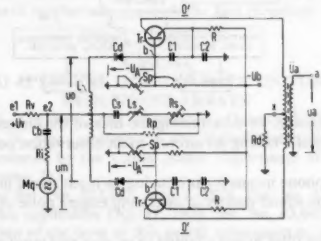
Rüdolf Heise, Wolfratshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,114

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2915134

Int. Cl.³ H03B *5/12*

U.S. Cl. 331—114 **14 Claims**



1. An oscillator arrangement which is controllable in frequency, comprising:

a frequency control input;

a frequency-determining circuit including two varactor diodes connected in opposing fashion, the capacitance of said varactor diodes largely representing the oscillating circuit capacitance, and an inductance having first and second terminals connected to respective varactor diodes and a tap connected to said frequency control input;

an output transformer including first and second terminals and a tap connected to a reference potential; and

a pair of feedback oscillator circuits each including a first terminal connected to a respective varactor diode, a second terminal connected to a respective transformer terminal to provide push-pull operation, and an emitter terminal connected to the emitter terminal of the other.

4,360,791

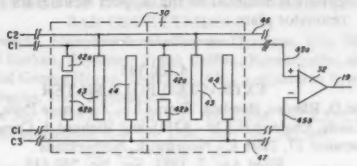
FREQUENCY CONVERTING FILTER

Jerry L. Norris, Dallas, and Clinton S. Hartman, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1977, Ser. No. 758,366

Int. Cl.³ H03H *15/02, 17/02;* **G11C** *19/28*

U.S. Cl. 333—165 **1 Claim**



1. A frequency converting filter comprising:

a split electrode charge coupled device transversal filter for receiving an input signal and having a plurality of serially connected split electrode stages which form an impulse response, said transversal filter including signal sampling means for providing samples of the input signal at a predetermined sampling frequency;

and

a non-sampling filter for providing the resultant output;

said transversal filter having an output lead coupled to an input of said non-sampling filter, and having frequency passbands of width Δf centered at fixed frequencies $nf_s \pm f_o$, where

n=an integer multiple of the sampling frequency,

f_s=the sampling frequency, and

f_o=the center frequency, removed from the sampling frequency, of the desired frequency passband;

the splits in said split electrode stages of said transversal filter having a profile proportional to $(\sin/n)(\cos 2\pi f_o n)$; and

said non-sampling filter having a single passband, said single passband having a width of less than $f_s - f_o - \Delta f/2$ and being centered to provide only a selected one of said passbands of said transversal filter as the resultant output.

4,360,792

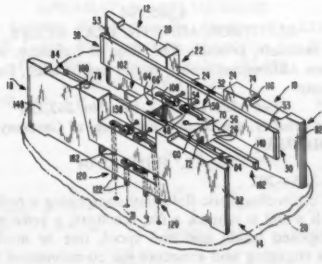
SEPARABLE MULTI-UNIT CRYSTAL NETWORK DEVICE

John D. Jennings, Andover; Walter E. Killerby, Lowell, both of Mass., and Robert L. Reynolds, Allentown, Pa., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Sep. 2, 1980, Ser. No. 183,130

Int. Cl.³ H03H *9/05, 9/15, 9/58*

U.S. Cl. 333—189 **18 Claims**



1. A crystal network device, which comprises:

an assembly of separable interconnected support members of electrical insulating material;

a plurality of unitary electrical terminals mounted on each of the support members, each terminal including a terminal portion which projects beyond the assembly of interconnected support members adjacent one side of the assembly;

a crystal resonator plate for each of the support members; and

lead wires extending from each of the crystal resonator plates and fixedly bonded to respective ones of the unitary terminals mounted on the support member for the crystal resonator plate.

4,360,793

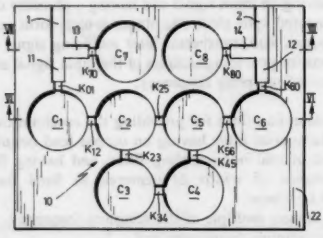
EXTRACTED POLE FILTER

John D. Rhodes, Boodels, Thorpe La., Tranmere Park, Guiseley, Leeds, England (LS20 - 8JH), and Richard J. Cameron, Gerberahof 27, 2201 E - Noordwijk, Netherlands

Filed Apr. 2, 1981, Ser. No. 250,115

Int. Cl.[3] H01P *1/208, 1/209*

U.S. Cl. 333—212 **3 Claims**



1. An electric transmission structure for implementing a transfer function with finite real-frequency transmission zeros, said structure comprising:

a main body (**10**) comprised of a plurality of resonant cavities (C_1–C_6) placed adjacent to each other with inductive coupling irises (e.g. K_{12}, K_{23}, . . .) between adjacent cavities, said resonant cavities being arranged symmetrically relative to a plane of conjugate symmetry (S), said main body synthesizing the linear phase part of the filter transfer function; and

at least one pair of pole resonant cavities (C_7, C_8) arranged symmetrically relative to said plane of conjugate symmetry, each resonant cavity pair synthesizing a pair of finite real-frequency transmission zeros of the filter transfer function,

the respective pole resonant cavities of said at least one pair of pole resonant cavities being connected across the input and output ends of the main body (**10**) through phase-shift waveguides (**11, 12**) having defined phase-shift lengths.

4,360,794

ELECTROMAGNETIC FLAT RELAY

Helmut Schedele, Diessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

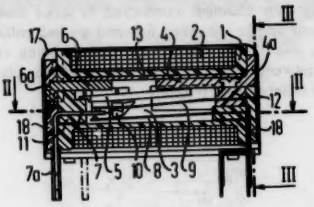
Filed May 11, 1981, Ser. No. 262,128

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1980, 8016573[U]

Int. Cl.[3] H01H *45/04*

U.S. Cl. 335—202 **4 Claims**

1. An electromagnetic flat relay comprising a hollow spool on which a coil is wound, a flat armature, a yoke and a pole piece disposed inside said coil spool, one or more contact elements engaging said armature for co-movement therewith and a carrier element having a U-shaped cross-section consisting of non-ferromagnetic metal and having a base which rests on said yoke and said pole piece opposite said armature and which has laterally depending flanks which at least partially surround said yoke and said pole piece, said yoke, said pole pice, said armature and said contact elements being connected



to said carrier for insertion inside said spool as a pre-adjusted unit.

4,360,795

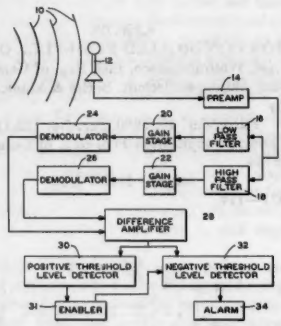
DETECTION MEANS

Dave Hoff, Brooklyn Park, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 3, 1980, Ser. No. 193,869

Int. Cl.[3] G08G *1/01, 1/04*

U.S. Cl. 340—38 R **4 Claims**



1. Apparatus for determining the time of the closest point of approach of a taxiing jet aircraft to an observation point, comprising:

microphone means for producing an input signal in response to the sound energy of operating engine noise of a taxiing jet;

low pass filter means adapted to receive said input signal and to provide an output comprising low signals having a frequency less than or equal to 1.0 KHZ;

high pass filter means adapted to receive said input signal and to provide an output comprising high signals having a frequency greater than or equal to 1.5 MHZ;

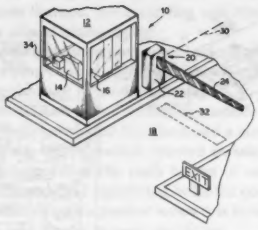
demodulator means for receiving said output signals from said high pass filter and said low pass filter, said demodulator means being adapted to produce a low frequency envelope from said low signal and a high frequency envelope from said high signal; and

comparator means for receiving said low frequency envelope and said high frequency envelope, said comparator means being adapted to provide a signal at the point in time when the amplitude of the low frequency envelope exceeds the amplitude of the high frequency envelope to thus signal the closest point of approach of said taxiing jet aircraft.

4,360,796
REGISTER-GATE SYSTEM

Ronald L. Shocknesse, 2851 S. King Dr., Apt. 618, Chicago, Ill. 60616

Filed Mar. 9, 1981, Ser. No. 242,131
Int. Cl.³ G08G *1/14*; E05F *15/20*; H01H *3/16*
U.S. Cl. 340—51 **5 Claims**



1. In a system having a barrier movable by a barrier actuation apparatus in response to a selected electrical signal and a manually operable cash register with a lockable drawer, the drawer is released by a latch mechanism in the register in response to a transaction having been entered into the register, an improvement comprising:

means for sensing a selected amount of movement of a selected portion of the latch mechanism in a first direction, in response to a transaction having been entered, as the latch mechanism moves to unlock the drawer;

means for supplying the selected electrical signal to the barrier actuation apparatus in response to said means for sensing having sensed the selected amount of movement in the first direction;

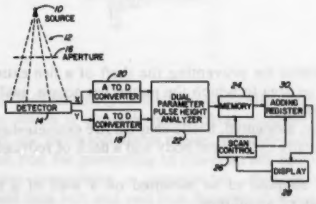
means for sensing a selected amount of movement of the selected portion of the latch mechanism opposite the first direction immediately after the drawer has been unlocked; and

said means for supplying including means for interrupting the selected signal to the barrier actuation apparatus in response to said means for sensing having sensed the selected amount of movement of the selected portion of the latch mechanism opposite the first direction.

4,360,797
CODED APERTURE IMAGING WITH UNIFORMLY REDUNDANT ARRAYS

Edward E. Fenimore, and Thomas M. Cannon, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 902,183, May 2, 1978, Pat. No. 4,209,780. This application Oct. 11, 1979, Ser. No. 83,909
The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.
Int. Cl.³ G01T *1/00*
U.S. Cl. 340—146.3 F **2 Claims**



1. A device for imaging a source of radiation comprising:

a uniformly redundant array aligned to aperture image said source of radiation;

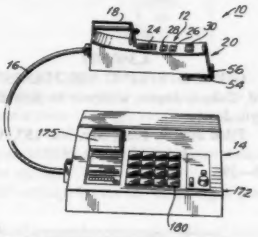
means for detecting said radiation imaged by said uniformly redundant array;

means for balance correlating information from said means for detecting to generate a decoded image of said source of radiation.

4,360,798
PORTABLE LASER SCANNING ARRANGEMENT FOR AND METHOD OF EVALUATING AND VALIDATING BAR CODE SYMBOLS

Jerome Swartz, Stonybrook; Shelley A. Harrison, Dix Hills; Edward Barkan, Bayshore; Frank Delfine, Farmingville, all of N.Y., and George Brown, Oquossoc, Me., assignors to Symbol Technologies, Inc., Hauppauge, N.Y.

Division of Ser. No. 911,171, May 31, 1978, Pat. No. 4,251,798. This application Apr. 25, 1980, Ser. No. 143,541
Int. Cl.³ G06K *9/38*
U.S. Cl. 340—146.3 AG **12 Claims**



1. A noise-resistant method of processing an electrical analog time-varying signal indicative of the detected intensity of the light reflected from a bar code symbol upon directing a laser light beam on the latter, said method comprising the steps of:

(a) establishing respective upper threshold levels at a fixed predetermined voltage value which is below and independent of the magnitudes of the respective peaks of the analog signal;

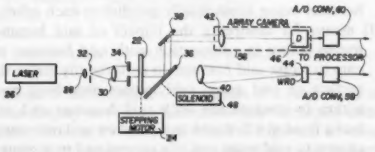
(b) establishing respective lower threshold levels at a fixed predetermined voltage value which is above and independent of the magnitudes of the respective valleys of the analog signal; and

(c) generating in response to establishing said upper and lower threshhold levels a series of digital pulses, each successive pulse having a time period which corresponds to the width of each successive bar of the symbol to be scanned.

4,360,799
HYBRID OPTICAL-DIGITAL PATTERN RECOGNITION APPARATUS AND METHOD

Robert D. Leighty, 604 Manor Dr., Vienna, Va. 22180, and George E. Lukes, 304 Cloverway, Alexandria, Va. 22314

Filed May 22, 1980, Ser. No. 152,441
Int. Cl.³ G06K *9/20*
U.S. Cl. 340—146.3 P **9 Claims**



1. An apparatus for providing improved pattern recognition data, comprising,

optical read-only memory means for storing a two dimensional image function having patterns to be recognized,

coherent light source means for irradiating said read-only memory means with coherent light, which becomes modulated with information corresponding to said two dimensional image function.

means responsive to said information contained in said coherent light for providing first data indicative of the optical power spectrum of said two dimensional image function, and

means also responsive to said information contained in said coherent light for providing second data indicative of the spatial intensity distribution of said two dimensional image function,

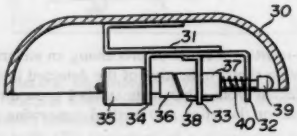
said improved pattern recognition data comprising said first and second data.

4,360,800

GONG STRIKING MECHANISM

Tadashi Ishii, Tokyo, Japan, assignor to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,894
Int. Cl.³ G08B *3/10*
U.S. Cl. 340—396 **4 Claims**



1. A motor actuated bell which comprises:

(a) a gong;

(b) a mounting frame affixed to and positioned substantially within the interior surface of said gong, said mounting frame being formed with three openings;

(c) an electric motor having a rotatable drive shaft, said motor being mounted on said mounting frame such that one end of said drive shaft extends through the first of said openings formed in said mounting frame;

(d) a cylindrical cam having a first end mounted on said end of said drive shaft which extends through the first of said three openings formed in said mounting frame and having a second end terminating in a cam surface;

(e) a hammer having a first end adjacent to the interior surface of the gong for striking said gong, said hammer being slidably supported through the second and third of said three openings formed in said mounting frame, the second end of said hammer being in continuous contact with said cam surface for smoothly converting the rotational movement of said drive shaft to reciprocal movement of said hammer, the axes of said drive shaft and said hammer being substantially parallel to each other; and

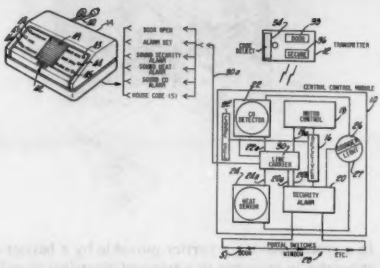
(f) means for absorbing the impact of said hammer, said means acting in conjunction with said hammer and said cam to cause said hammer to reciprocally strike the inner surface of said gong, said impact absorbing means for acting in conjunction with said hammer and said cam being fixed at a first end to a point on said mounting frame closest to said gong and at a second end to a point on said hammer intermediate the second and third openings formed in said mounting frame.

4,360,801

HOME SECURITY AND GARAGE DOOR OPERATOR SYSTEM

Dean C. Duhame, Roseville, Mich., assignor to Stanley Vemco, Detroit, Mich.

Filed Apr. 14, 1980, Ser. No. 140,045
Int. Cl.³ G08B *19/00*; G08C *19/00*; E05F *15/20*; G08B *5/22*
U.S. Cl. 340—521 **39 Claims**



33. A home security and automatic garage door operator system comprising:

a central control module containing garage door actuator means for positioning the garage door and security alarm means for detecting illegal entry into a building;

means for setting said security alarm system; and

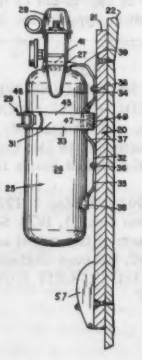
lock out means coupled to said door actuator means and being responsive to a signal from the setting means for disabling said door actuator means when the security alarm has been set.

4,360,802

AUTOMATIC THEFT AND FIRE ALARM APPARATUS FOR FIRE EXTINGUISHERS

Anthony A. Pinto, 366 N. Main St., Andover, Mass. 01810

Filed Mar. 3, 1981, Ser. No. 240,250
Int. Cl.³ G08B *13/14*
U.S. Cl. 340—568 **5 Claims**



1. Apparatus for preventing the theft of a fire extinguisher located in an area to which the public has access, said apparatus comprising:

a portable, elongated, bottle-shaped, fire extinguisher having a generally cylindrical body and a neck of reduced diameter;

a panel, adapted to be mounted on a wall of a common hallway of a building;

a fire extinguisher clamp bracket having an elongated metal affixation strap with upper and lower straight portions affixed flatwise to said panel, said upper portion mounting

an outwardly extending, bifurcated arm engaging the neck of said extinguisher and said portions being spaced apart by an intermediate arcuate portion bent away from said panel;

said bracket having a flexible, metal clamping strap with a central portion affixed to the inside of the intermediate, arcuate portion of said elongated metal strap and a pair of laterally extending terminal ends, each with releasable latch means thereon, for encircling and clamping around the body of said extinguisher;

said intermediate arcuate portion of said affixation strap and the underlying central portion of said clamping strap each having registering holes therethrough;

and an electric alarm circuit including a source of electricity, an electrically energized fire alarm and a normally closed, electric push button switch located in said panel under said arcuate portion, the push button of said switch extending through said registering holes for contact with the body of said fire extinguisher when it is in said bracket to maintain said circuit in open condition;

whereby the holding of said switch in open condition by sliding an object between said extinguisher and said bracket is prevented by said arcuate portion and said central portion of said straps but removal of said extinguisher from said bracket closes said circuit and energizes said alarm.

4,360,803

DOOR LOCK ASSEMBLY WITH ELECTRICAL ALARM

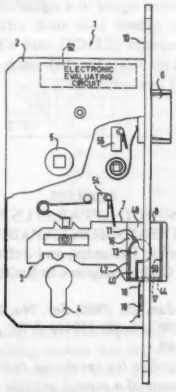
Bernd Helland, Telgte, Fed. Rep. of Germany, assignor to Aug. Winkhaus, Telgte, Fed. Rep. of Germany

Filed Jun. 5, 1979, Ser. No. 45,846

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1978, 7817702[U]

Int. Cl.³ G08B *13/06*

U.S. Cl. 340—542 15 Claims



1. A door lock assembly for a door comprising: a lock frame; a lock bolt which is movable into locking position with said lock frame; and electrical alarm means responsive to pressure on said lock bolt for generating an alarm signal; said electrical alarm means comprising a piezoelectric element arranged between said lock bolt and said lock frame in the region of the locking end of said lock bolt on the side thereof which is located in the direction of movement toward said locking position.

4,360,804

PATTERN DISPLAY SYSTEM

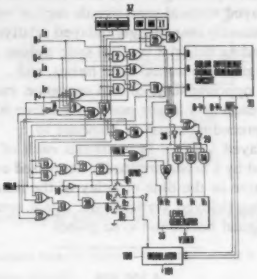
Toshio Ohura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1980, Ser. No. 137,800

Claims priority, application Japan, Apr. 10, 1979, 54-43494

Int. Cl.³ G09G *1/14*

U.S. Cl. 340—703 5 Claims



1. A pattern display system for use with color picture displays on a picture screen through random scanning comprising:

color signal generator means receiving color data and generating a color signal;

voltage levelof voltage levels for deciding a luminance of color;

amplitude control means having a plurality of information of amplitudes for deciding a saturation of color;

logical circuit means having a control signal storage circuit and a select signal generating circuit for generating a select signal which selects one of the plurality of information of voltage levels and one of the plurality of information of amplitudes based on the output of the control signal storage circuit; and

transfer means of said color signal which has already been controlled of its amplitude and voltage level.

4,360,805

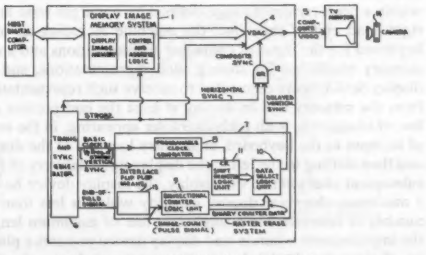
DIGITAL ERASE OF RASTER LINES

Edward W. Andrews, Milwaukee, and Eugene C. Williams, Waukesha, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 1, 1980, Ser. No. 192,736

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—744 12 Claims



RASTER ERASE SYSTEM BLOCK DIAGRAM

1. A method of obscuring the perception of a base raster of a raster scan display device by bidirectionally vertically shifting said base raster in a manner in which a sequence of other rasters are produced with a maximum shift of any one of such other rasters in either direction being less than the distance between a pair of adjacent horizontal scan lines of said base

raster, said base raster being produced by scanning an electron beam in response to original vertical and horizontal sync pulses, said method comprising:

presenting a predetermined number of rasters with the horizontal lines thereof shifted vertically by a predeterminedly-changed amount in a cyclical sequence wherein

(a) in one stage of said sequence, rasters are presented each at an increasingly higher position relative to the position corresponding to said base raster in response to

(i) delayed vertical sync signals each of which is predeterminedly increasingly delayed relative to the corresponding original vertical sync pulses, and to

(ii) original horizontal sync pulses, and

(b) in an opposite stage of said sequence, rasters are presented each at a lower position relative to the immediately preceding raster in response to

(i) delayed vertical sync signals each of which is delayed by a predeterminedly decreased amount of time relative to the time of delay of the immediately preceding delayed vertical sync signal, and to

(ii) original horizontal sync pulses.

4,360,806

DISPLAY FOR WORD PROCESSOR PRESENTING MARGIN ZONE MARKERS

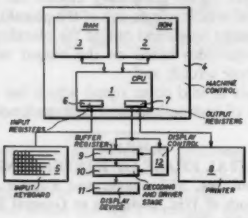
Karl-Friedrich von Knorre, Varel; Peter Tillich, and Gottfried Herbermann, both of Wilhelmshaven, all of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Apr. 4, 1980, Ser. No. 137,473

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1979, 2913624

Int. Cl.³ G09G *3/20*

U.S. Cl. 340—792 **11 Claims**



1. In a display device in a character processing machine, which machine operates to provide text in the form of successive lines of characters, with the length of each such line being within a predetermined range defined by a margin zone at the right-hand end of each line, the machine including an input keyboard for the input of character representations and a data memory connected for storing such representations, and the display device being connected to receive such representations from the memory and to display at least the end portion of a line of characters, with each character appearing, in the order of its input to the keyboard, at an entry location of the display and then shifting to the left in the display upon delivery of each subsequent character to the display, the display device having a maximum character display capacity which is less than the number of characters in a single text line of maximum length, the improvement wherein said display device presents a plurality of character display locations equal in number, and corresponding in position, to the spaces of the margin zone at the end of each line of characters, said display device comprises marker display elements at said display locations, and said machine comprises means connected to said display device to actuate said marker display elements for causing margin zone markers to be displayed in said display device at said character display locations.

4,360,807

DEVICE FOR REMOTE CONTROL OF HYDRAULIC OR PNEUMATIC MACHINE TOOLS

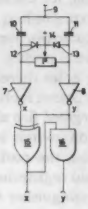
Ted Zettergren, Kungsgarden 3402, 870 52 Nyland, Sweden

Filed Oct. 3, 1980, Ser. No. 193,537

Claims priority, application Sweden, Oct. 11, 1979, 7908450

Int. Cl.³ H04Q *9/00*; H01H *47/32*

U.S. Cl. 340—825.2 **5 Claims**



1. A device for remote control of hydraulic or pneumatic machine tools, comprising a selector valve for different hydraulic functions which is provided with a number of spring-centered slides and two electrohydraulic or electropneumatic converters connected to each slide, and comprising a control unit capable to transfer orders to a receiver unit, which in its turn is capable to control said converters according to said impulses, wherein the control unit comprises a ring counter (B), which is controlled by an oscillator (A) and capable to emit a scanning signal to each of a plurality of transducers (C1–C6) actuated by respective manual operating member (1–6), each transducer being capable to convert the direction and deflection of said operating members and each transducer corresponded by two of said converters (N), which transducers (C1–C6) are capable during the duration of said scanning signal to emit two output signals, one (y) of which corresponds to said direction and the other one (z) to said deflection, and that an encoder (E) is provided to assign an address to the output signals, and the receiver unit comprises a decoder (K) for emitting a decoded signal to a signal converting circuit (L) addressed thereby, where two such circuits (L) are corresponded by a transducer (C1–C6), and which circuits (L) are connected each to an amplifier (M), each amplifier capable to control one of said converters (N).

4,360,808

RADIO CONTROL APPARATUS WITH VOICE TRANSMISSION CAPABILITY

Jay Smith, III, Pacific Palisades, and Jeffrey M. Moskin, Los Angeles, both of Calif., assignors to Smith Engineering, Santa Monica, Calif.

Filed Jan. 25, 1980, Ser. No. 115,457

Int. Cl.³ G08C *19/00*; H04Q *7/02*; A63H *30/04*

U.S. Cl. 340—825.69 **16 Claims**

12. A radio controller for receiving radio transmissions and controlling movement of a model vehicle comprising:

means for receiving a transmitting carrier signal modulated with vehicle control signals;

control signal demodulating means for recovering said control signals from said transmitted carrier signal;

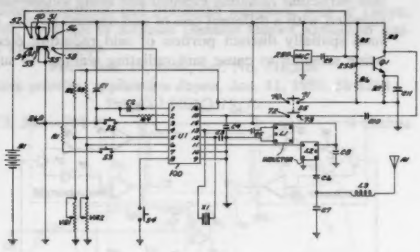
a drive motor for propelling the vehicle;

a power source;

a power on/off switch;

power control means coupled to said power source through said power on/off switch and coupled to said control signal demodulating means for controlling said drive

motor in response to said control signals so as to vary the drive motor speed; and



warning means for providing a warning signal when said power control means is not supplying power to said drive means when said power switch is switched on.

4,360,809

MATRIX SWITCH AND METHOD OF CONTROLLING CROSS POINT SWITCH OF A MATRIX SWITCH

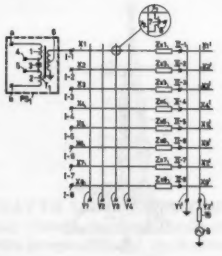
Wouter Bourgonje, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1981, Ser. No. 227,014

Claims priority, application Netherlands, Jan. 29, 1980, 8000529

Int. Cl.³ H04Q 9/00, 1/52

U.S. Cl. 340—825.86 5 Claims



1. A switching matrix comprising:

a first switching matrix having a plurality of input lines, a plurality of output lines and a plurality of crosspoint switches for selectively connecting one or more input lines to one or more output lines,

a second switching matrix having a plurality of input lines, at least one output line and a plurality of crosspoint switches, each input line of said second switching matrix being connected to the input lines of said first switching matrix by means of an impedance, the output line of said second switching matrix being coupled to a point of substantially constant potential for terminating with the said impedance the input lines of said first switching matrix selected by said crosspoint switches of said second switching matrix.

4,360,810

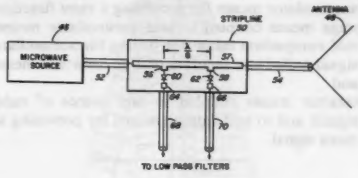
MULTICHANNEL HOMODYNE RECEIVER

Jeremy A. Landt, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 19, 1981, Ser. No. 226,283

Int. Cl.³ G01S 13/78

U.S. Cl. 343—6.5 R 10 Claims



1. A homodyne radar transmitter/receiver device comprising:

microwave source means for producing a microwave transmission signal;

a combination transmitter/receiver antenna for transmitting said microwave transmission signal and detecting both modulated and unmodulated backscatter signals;

transmission line means connecting said microwave source and said combination transmitter/receiver antenna;

at least two output connectors attached to said transmission line means at intervals equal to approximately ¼ wavelength of said microwave transmission signal;

means for detecting attached to said output connectors;

low pass filter means connected to said means for detecting;

signal combiner/amplifier means connected to said low pass filter means for producing a single output containing modulated backscatter information for all phase conditions of said modulated and unmodulated backscatter signals.

4,360,811

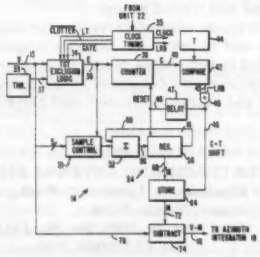
ADAPTIVE ZERO MEAN SYSTEM FOR CONTROLLING NOISE FALSE ALARM RATE

Thomas C. Cantwell, Jr., Yorba Linda; Richard D. Wilmot, Buena Park, and Jack R. Ballantyne, Santa Ana, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 20, 1980, Ser. No. 198,902

Int. Cl.³ G01S 7/02

U.S. Cl. 343—7 A 10 Claims



1. A false alarm control system responsive to a source of radar video signals from a plurality of radar sweeps each having T range bins, said system forming a mean signal and providing a zero mean signal and comprising:

sample control means coupled to receive said video signals;

accumulator means coupled to said sample control means;

target exclusion means responsive to said video signals for

providing count pulses in response to said video signals, and coupled to control said sample control means to pass said video signals to said accumulator means in response to said count pulses;

counter means coupled to said target exclusion means for providing a count of said count pulses;

comparison means coupled to said counter means for comparing the count with T and providing a comparison signal and coupled to said counter means and to said accumulator means for providing a reset function;

storage means coupled to said accumulator means and to said comparison means for storing the accumulated video signal scaled as a function of T to form said means signal; and

subtractor means coupled to said source of radar video signals and to said storage means for providing said zero mean signal.

4,360,812

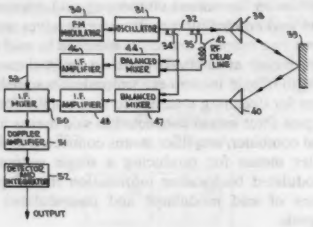
FM-CW FUZE

Salvador J. Peperone, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 16, 1967, Ser. No. 624,666

Int. Cl.³ G01S *13/32*; F42C *13/04*

U.S. Cl. 343—14 **3 Claims**



1. An improved apparatus for receiving and processing the target return signal in an FM-CW distance measuring system, comprising:

(a) first means receiving said target return signal and comparing said target return signal with a sample of the transmitted signal,

(b) second means for comparing a sample of the transmitted signal with a delayed sample of said transmitted signal and amplifying the result of said comparison,

(c) third means connected to the output terminals of said first and said second means for comparing the outputs of said first and said second means,

(d) fourth means adapted to receive the output of said third means and to select the Doppler frequency component included in said output of said third means,

(e) utilization means connected to the output of said fourth means and adapted to receive said Doppler frequency.

4,360,813

POWER COMBINING ANTENNA STRUCTURE

George W. Fitzsimmons, Lynnwood, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 19, 1980, Ser. No. 131,664

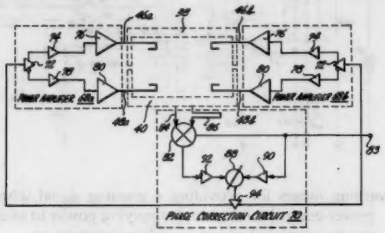
Int. Cl.³ H04B *7/00*

U.S. Cl. 343—100 R **14 Claims**

1. An antenna comprising:

at least one radiating element for supplying electromagnetic radiation in response to at least two separate applied electrical signals;

antenna feed means including at least two independently excitable antenna excitation elements positioned in operative association with each said radiating element of said antenna, each independently excitable excitation element that is associated with a particular radiating element being electronically coupled to a spatially distinct portion of that particular radiating element and being independently supplied with a different one of said applied signals, each such spatially distinct portion of said radiating element being selected to cause said radiating element to supply



electromagnetic radiation of like polarization and like phase when each said associated independently excitable excitation element is independently supplied with an electrical signal of predetermined frequency and phase; and

transmission line means for connecting each of said antenna excitation elements of said antenna feed means for receiving said applied electrical signals.

4,360,814

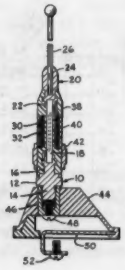
ANTENNA LOADING DEVICE WITH SERIES CONNECTED LOADING COILS

Donald H. Wells, 7127 Kipling, Holland, Ohio 43528

Filed Nov. 19, 1979, Ser. No. 95,219

Int. Cl.³ H01Q *9/00*

U.S. Cl. 343—750 **17 Claims**



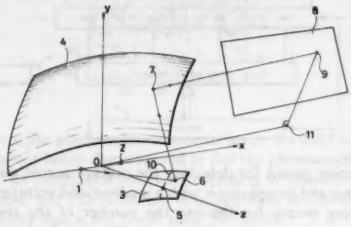
1. A variable mutual transductance tuned circuit, and the like, comprising: a first helically wound coil, a second helically wound coil positioned coaxially inside of said first coil, first and second terminal elements, means seried connecting said coils to each other and to said first and second terminal elements in an electrically conductive arrangement so that the magnetic fields of both of said coils are common, are generally in phase, and add at resonance; an electrically conductive inductance producing tuning member positioned in the field of both of said coils and isolated from ground so that electrical flow therein produces a magnetic field which interacts with the magnetic field of both said coils; and means for changing the inductive interactance of said member to the combined magnetic field of said coils.

4,360,815

BIFOCAL REFLECTOR ANTENNA AND ITS CONFIGURATION PROCESS

Yoshihiko Mizuguchi, and Masataka Akagawa, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1980, Ser. No. 218,236
Claims priority, application Japan, Jan. 11, 1980, 55-1268
Int. Cl.³ H01Q 19/19
U.S. Cl. 343—781 P 4 Claims



1. A bifocal reflector antenna comprising a main reflector having two foci which are spaced from one another on opposite sides of and displaced from the axis of the antenna, a subreflector having at most two foci corresponding to said two foci of said main reflector, and at least one feed horn placed at or near the focus or foci for said subreflector, characterized in that said subreflector and said main reflector are respectively constructed in plane symmetry, and are also so constructed that a beam radiated from said feed horn reaches the antenna aperture via said subreflector and said main reflector while satisfying the conditions that (a) at every reflective point on sid subreflector and main reflector said beam meets the law of reflection of a light beam and (b) at every reflective point on said subreflector and main reflector the total length of the beam path from said feed horn to the antenna aperture has the same exactly constant value.

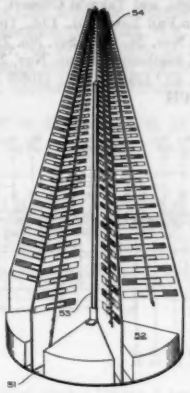
4,360,816

PHASED ARRAY OF SIX LOG-PERIODIC DIPOLES

Robert G. Corzine, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 21, 1971, Ser. No. 167,059
Int. Cl.³ H01Q 11/10
U.S. Cl. 343—792.5 4 Claims

1. A direction finding antenna array comprising;
six planar log-periodic antennas having at least one edge and an apex;
the six antennas being physically supported such that a conical surface of revolution coincides with said at least one edge of each of the antennas;
each antenna comprising a multiplicity of uniformly loaded dipole elements;
said elements being spaced logarithmically along each antenna;
each antenna being uniformly tapered from the apex thereof to the widest portion thereof;
said loading comprising an area equal to α times β where α=a constant multiplied by the wavelength of interest



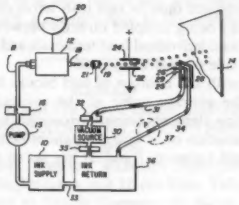
and β equals another constant multiplied by the wavelength of interest.

4,360,817

LOW EVAPORATION INK CATCHER FOR INK JET PRINTING SYSTEM

George W. Arway, River Grove, and Frank Eremity, Hanover Park, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed May 15, 1981, Ser. No. 263,896
Int. Cl.³ G01D 15/18
U.S. Cl. 346—75 6 Claims



1. In an ink jet printing apparatus including an assembly for projecting a liquid ink stream toward a surface, a portion of such ink stream being used to mark the surface and the remainder being carried away, the combination comprising:
a vacuum source for providing a predetermined level of air flow,
a catcher having a common entryway through which the remainder of the ink stream not used in marking the surface is directed and air is drawn,
said catcher including receptacle means having an entrance to intercept the stream directed thereto and a liquid conveyor to carry away the intercepted ink liquid along a first flow path and an air intake means positioned adjacent to said receptacle means and having a second flow path separate from said first flow path and connected to said vacuum source to maintain air flow in proximity to said receptacle to sweep ink particles away from said receptacle entrance.

4,360,818

HEAT-SENSITIVE RECORDING HEAD WITH MINIMUM NUMBER OF SWITCHING DIODES

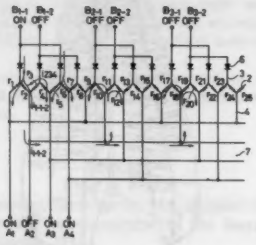
Haruhiko Morigachi, and Takashi Ohmori, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,999

Claims priority, application Japan, Nov. 28, 1979, 54-152889

Int. Cl.³ G01D *15/10*; H05B *1/02*

U.S. Cl. 346—76 PH **5 Claims**



1. A heat-sensitive recording head comprising:

an insulating substrate;

an array of heat generating elements;

a plurality of leads alternately arranged on both sides of said array of heat generating elements on said insulating substrate with said heat generating elements interposed between said leads;

a plurality of lead wires connected to predetermined ones of said leads, a plurality of common lead terminals, and a plurality of individual lead terminals, said lead wires being arranged in matrix wiring form, predetermined ones of said lead wires on a first side of said array being coupled to corresponding ones of said common lead terminals, said lead wires coupled to said common lead terminals being coupled to said leads in blocks with two lead wires provided for each of said blocks, each of said lead wires coupled to said common lead terminals being coupled to leads coupled to alternate ones of said heating elements, predetermined ones of said lead wires on a second side of said array being coupled directly between corresponding ones of said individual lead terminals and said leads on said second side of said array; and

wherein, with the number of said blocks being represented by n, the average value of the resistances of said heat generating elements being represented by $\bar{r}$, and the maximum variation of of said resistances being represented by $\pm\Delta r$, said values n, $\bar{r}$ and Δr are set so as to satisfy:

$$n < \frac{1}{2}\left(1 + \frac{2\bar{r}}{\Delta r}\right).$$

4,360,819

THERMAL RECORDING APPARATUS

Tamio Saito, Oume; Yoshikatsu Fukumoto, Hamura, and Kiyomi Tagaya, Oume, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 5, 1981, Ser. No. 240,970

Claims priority, application Japan, Mar. 12, 1980, 55-31279

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **12 Claims**

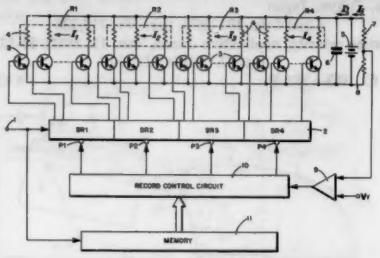
1. A thermal recording apparatus for recording information in accordance with input recording signals comprising:

a plurality of aligned thermal resistive elements;

a plurality of drive means, each serially connected to a respective one of said thermal resistive elements, for driving said thermal resistive elements;

a DC power source connected in parallel to said thermal resistive elements and said drive means, said source having a smaller current capacity than the necessary current to simultaneously drive said thermal resistive elements;

a capacitor connected in parallel with said source;



a detecting means for detecting the voltage across said capacitor and comparing it with a predeterined voltage; and,

a limiting means for limiting the number of the thermal resistive elements simultaneously driven when said detected voltage is less than said predetermined voltage.

4,360,820

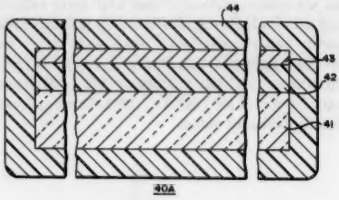
LASER RECORDING MEDIUM

Alette J. Forster, Sunnyvale, and Muriel M. Ockers, San Jose, both of Calif., assignors to OMEX, Santa Clara, Calif.

Filed Oct. 1, 1979, Ser. No. 80,516

Int. Cl.³ G01G *15/34*

U.S. Cl. 346—135.1 **4 Claims**



1. A laser recording medium comprising: a transparent substrate; a layer of plastic material formed directly on said substrate; a layer of optical energy absorbing material formed on said layer of plastic material; a second layer of plastic material formed on said layer of energy absorbing material in a vapor deposition process wherein a hot reactive monomer vapor is condensed as a polymeric coating on said layer of optical energy absorbing material without substantially affecting the physical integrity of said layer of optical energy absorbing material or the layer of plastic material thereunder, said second layer of plastic material being formed over all surfaces of said laser recording medium.

4,360,821

SOLID-STATE IMAGING DEVICE

Toshihisa Tsukada, Tokyo; Eiichi Maruyama, Kodaira; Toru Baji, Kokubunji; Saburo Ataka, Tokyo; Yoshinori Imamura, Hachioji; Akira Sasano, Tokyo; Masaharu Kubo, Hachioji; Norio Koike, Tokyo, and Shusaku Nagahara, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1979, Ser. No. 66,230

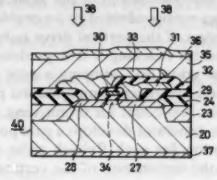
Claims priority, application Japan, Aug. 18, 1978, 53/100060; Jul. 27, 1979, 54/103031[U]

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—31 **11 Claims**

1. In a solid-state imaging device having a plurality of photo-

sensitive regions and a semiconductor substrate which includes at least one scanning means for scanning the photosensitive regions, the photosensitive regions including at least a layer of a photosensitive material extending over the semiconductor substrate and a transparent electrically conductive film extending over the photosensitive material layer; the solid-state imaging device being characterized in that the photosensitive material is an amorphous material containing at least 50 atomic-% of silicon and 5 to 50 atomic % of hydrogen and having a dark resistivity that is not lower than 10^{10} Ω-cm.



4,360,822

SEMICONDUCTOR DEVICE HAVING AN IMPROVED SEMICONDUCTOR RESISTOR

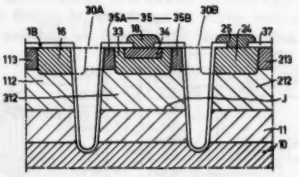
Bernard P. Roger, Carpiquet, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,414

Claims priority, application France, Feb. 14, 1979, 79 03759

Int. Cl.³ H01L *27/04, 29/06;* H01C *7/00*

U.S. Cl. 357—46 **7 Claims**



1. A semiconductor device having a semiconductor body with a substantially flat surface, a substrate region of a first conductivity type, a first epitaxial layer of the second, opposite, conductivity type on said substrate region and a second epitaxial layer of the first conductivity type on said first epitaxial layer, said device comprising a semiconductor resistor having a strip-shaped resistance zone of the second conductivity type, extending from the surface into the first epitaxial layer and having a higher doping concentration than that of the first epitaxial layer, said resistance zone being situated between two parallel grooves extending from the surface into the substrate region, and a surface-adjoining strip-shaped surface zone of the first conductivity type which is provided in said resistance zone and which is surrounded entirely by the resistance zone within the semiconductor body, the resistance zone being separated laterally from the grooves by a region of the first conductivity type.

4,360,823

SEMICONDUCTOR DEVICE HAVING AN IMPROVED MULTILAYER WIRING SYSTEM

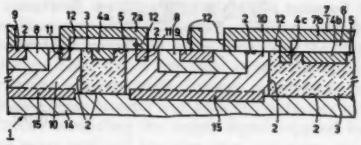
Johannes A. A. van Gils, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 885,764, Mar. 13, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 126,235

Claims priority, application Netherlands, Mar. 16, 1977, 7702814

Int. Cl.³ 357 *59, 84;* H01L *23/48, 29/44, 29/04*

U.S. Cl. 357—68 **5 Claims**



1. A semiconductor device having a semiconductor body including an integrated circuit having a plurality of semiconductor circuit elements adjacent the surface of said body, which comprises:

a first electrically insulating layer adjacent the surface of said semiconductor body, portions of said first insulating layer serving to laterally isolate adjacent circuit elements;

a first metallization pattern which is sunken into a portion of the first insulating layer through only a part of the thickness of said first layer, the surface of said first metallization pattern substantially coinciding with that of the first layer and said circuit elements;

a second electrically insulating layer overlying said first layer, the first metallization pattern sunken therein and portions of said circuit elements; and

a second metallization pattern on said second layer, overlying said first pattern and being separated therefrom by said second layer, the second metallization pattern contacting at least one region of at least one of said semiconductor circuit elements through a contact hole in the underlying second layer.

4,360,824

SYSTEMS FOR RECORDING BOTH INFORMATION AND PILOT SIGNALS DIRECTLY ON RECORDING MEDIUM

Nobuaki Takahashi, Yamato; Kazunori Nishikawa, Machida; Isao Masuda, Sagamihara, and Hideo Sato, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 21, 1980, Ser. No. 123,117

Claims priority, application Japan, Feb. 23, 1979, 54-19777

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—323 **6 Claims**

1. A system for recording both information and pilot signals directly on recording medium, said system comprising:

means for generating a rectangular waveform signal of a single and specific frequency;

means for generating an artificial synchronizing signal having a duration which is fixed in every specific period responsive to the rectangular waveform signal;

means responsive to the artificial synchronizing signal for generating a duration signal which is equivalent to the duration of an artificial synchronizing signal;

means for generating pilot signals for tracking control, said pilot signals having substantially no frequency component which is approximately equal to the frequency of the rectangular waveform signal;

means for positioning the rectangular waveform within the duration of the artificial synchronizing signal and for time

compressing a pulse code modulated or delta modulated digital information signal, so that the digital information signal exists in a time interval other than within the duration of the artificial synchronizing signal;

, modulator means for encoding the compressed digital information signal and for generating the digital information signal successively; and

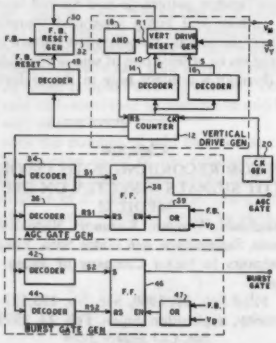
means for recording the digital information signal and the rectangular waveform signal along a main track on a recording medium and the pilot signals along pilot signal tracks which are contiguous to the main track.

4,360,825

VERTICAL DRIVE GENERATOR AND HORIZONTAL RATE GATE GENERATOR FOR A TELEVISION RECEIVER

Gopal K. Srivastava, Buffalo Grove, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 22, 1980, Ser. No. 219,086
Int. Cl.³ H04N 9/46, 5/06
U.S. Cl. 358—20 **10 Claims**



1. In a television receiver which develops flyback pulses and variable width vertical rate pulses, and which includes a clock generator and signal processing circuitry requiring gating at a horizontal line rate, a vertical drive generator for converting the vertical rate pulses to constant width vertical drive pulses, combined with a gate generator for gating the signal processing circuitry at a horizontal line rate, comprising:

vertical drive means responsive to a variable width vertical rate pulse for initiating a vertical rate drive pulse and for generating a counter-enabling signal;

a counter receiving clock pulses from the clock generator and responsive to the counter-enabling signal for counting the clock pulses;

decoding means responsive to said counter reaching a given count for disabling said vertical drive means such that the vertical drive pulse is terminated, whereby the width of the vertical drive pulse corresponds to the interval required for the counter to reach said given count, irrespective of the width of the vertical rate pulse;

a timing signal generator receiving flyback pulses and responsive to the termination of the vertical drive pulse for causing the counter to begin counting anew from an initial count upon receipt of each flyback pulse which occurs subsequent to the termination of the vertical drive pulse,

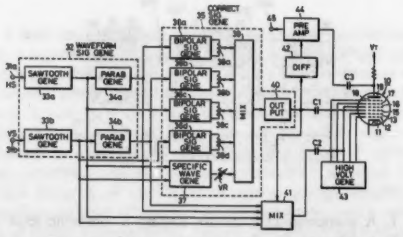
at least one gating means adapted to be enabled subsequent to the termination of the vertical drive pulse and responsive to the counter reaching a first predetermined count above its initial count for initiating a gate pulse, and responsive to the counter reaching a second predetermined count above the first count for terminating the gate pulse so that the gate generator develops a gate pulse of a predetermined duration for each flyback pulse which occurs subsequent to the termination of the vertical drive pulse.

4,360,826

IMAGE PICKUP DEVICE

Kenichi Miyazaki, No. 118, Shimokuzawa, Sagamihara-City, Kanagawa-Ken; Tadayoshi Miyoshi, No. 1166, Nishiterao-Cho, Kanagawa-Ku, Yokohama-City, Kanagawa-Ken; Itsuo Takanashi, No. 3-5, Shiomidai, Isogo-Ku, Yokohama-City, Kanagawa-Ken; Shintaro Nakagaki, No. 79, Honmura-Cho, Asahi-Ku, Yokohama-City, Kanagawa-Ken; Koichiro Motoyama, No. 28, Ninomiya, Ninomiya-Machi, Naka-Gun, Kanagawa-Ken; Sumio Yokokawa, No. 162-3, Mitsukyo, Seya-Ku, Yokohama-City, Kanagawa-Ken, and Hiroshi Ichimura, No. 1-16-10, Todoroki, Setagaya-Ku, Tokyo, all of Japan

Filed Feb. 2, 1981, Ser. No. 230,894
Claims priority, application Japan, Feb. 4, 1980, 55-12721[U]
Int. Cl.³ H04N 9/06
U.S. Cl. 358—44 **6 Claims**



1. An image pickup device capable of obtaining a color multiplexed signal comprising:

an image pickup tube provided with a striped filter which is a repetition of a plurality of stripes, and a pair of collimation forming electrodes which form a collimation;

voltage applying means for respectively applying predetermined voltages for forming said collimation to said pair of collimation forming electrodes of said image pickup tube, said collimation being formed responsive to a voltage ratio of said voltages applied to each of said collimation forming electrodes; and

correction voltage applying means for varying the collimation forming voltage ratio by applying a correction voltage to one of said pair of collimation forming electrodes,

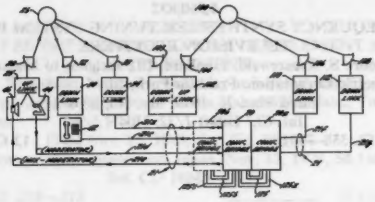
said correction voltage having a waveform such that the signal level ratios between the signals of the stripe parts of the striped filter in the color multiplexed signal obtained from said image pickup tube, are substantially constant.

4,360,827

METHOD AND MEANS FOR INTERACTIVE AUDIO AND VIDEO CONFERENCING

Daryl Braun, Harvard, Ill., assignor to Darome, Inc., Harvard, Ill.

Filed Jun. 2, 1981, Ser. No. 269,461
Int. Cl.³ H04N 5/04
U.S. Cl. 358—85 10 Claims



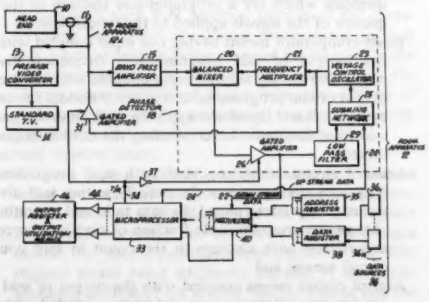
1. A method of establishing an interactive audio and video conference in which the video signal is transmitted to the interactive sites via satellite, comprising the steps of: connecting a plurality of interactive sites by means of telephone lines to a conferencing bridge to create a mix signal, connecting a first and second audio line between a television studio site and the bridge site, delaying any audio signal received from the studio site via the first audio line by an interval sufficient to compensate for differences between television and telephone transmission time, connecting the delayed audio signal to the bridge for inclusion in the mix signal for transmission via the telephone lines to the interactive sites, and creating a mix minus moderator signal and transmitting that signal via the second audio line to the studio site.

4,360,828

HOTEL/MOTEL POWER LOAD CONTROL AND BILATERAL SIGNALLING APPARATUS

Robert S. Briggs, Jr., and James W. Porter, both of Richardson, Tex., assignors to Spectradyne, Incorporated, Richardson, Tex.

Filed Aug. 7, 1978, Ser. No. 931,683
Int. Cl.³ H04N 7/10
U.S. Cl. 358—86 7 Claims



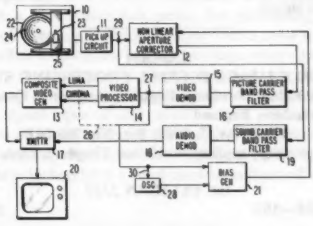
1. In combination; signal distribution cable means; head end means and plural station means each connected to said cable; each of said head end and station means comprising transmission means and reception means; said transmission means of said head end including means for impressing a data channel on said cable for distribution to said receiving means of said station means; each of said station means including a stored program controlled microprocessor, said reception means of said station means including detector means for receiving said data channel and supplying the information derived therefrom to said microprocessor, each of said transmission means of said station means including means responsive to outgoing data supplied thereto by said microprocessor for supplying said outgoing data to said cable for delivery to said head end, wherein said head end data channel impressing means comprises angle modulation means, and wherein said station receiver detector means comprises a phase detector feedback circuit comprising the series connection of a balanced mixer, low pass filter and variable frequency oscillator controlled by said filter, further comprising means connecting the output of said balanced mixer with a data input of said microprocessor for furnishing received data channel information thereto wherein said phase detector feed back circuit further includes gated means connecting the output signal supplied by said balanced mixer with said low pass filter, and means for selectively disabling said gated means during periods when said station means is transmitting, whereby the low pass filter changes the transmission frequency of said station means to a non-interfering value if said station means fails in a transmitting mode.

4,360,829

ACTIVE DISTORTION ELIMINATION CIRCUITRY FOR A VIDEO DISC PLAYER

George H. N. Riddle, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 24, 1980, Ser. No. 162,593
Int. Cl.³ H04N 5/76, 5/21
U.S. Cl. 358—340 16 Claims



1. A disc record player comprising:

means for recovering modulated information signals including video signals and intermodulation distortion components from a disc record;

a non-linear compensating means responsive to a bias signal for reducing said intermodulation distortion signal components in the recovered signal;

signal summing means having an output terminal connected for applying said bias signal to said compensating means, said summing means having a first input terminal connected for receiving a reference signal, and having a second input terminal; and

further means responsive to said intermodulation distortion components for generating a control signal at an output terminal thereof; and

means connecting the output terminal of said further means to the second input terminal of said summing means, wherein said bias signal is related to the composite of the control signal and the reference signal and tends to reduce said intermodulation distortion components.

4,360,830

METHOD FOR HORIZONTAL AND VERTICAL CONTOUR CORRECTION OF A DIGITIZED ANALOGUE SIGNAL

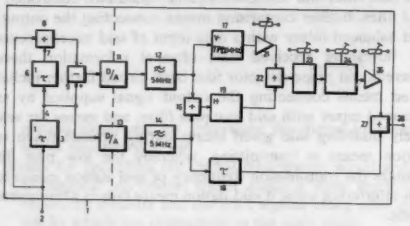
Dieter Poetsch, Ober-Ramstadt; Werner Becker, Mainz; Helmut Rädecke, Darmstadt, and Volker Massmann, Mühltal, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 9, 1980, Ser. No. 185,412

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2937958

Int. Cl.³ H04N *5/14, 9/535*

U.S. Cl. 358—162 **9 Claims**



1. In a method for the horizontal and vertical contour correction of a digitized video signal in which the said video signal is delayed twice by one line, is tapped off as a main digitalized video signal after a one line delay, the two line delayed video signal and the undelayed video signal are added and their sum is subtracted from the video signal delayed by one line so as to form a digitalized correction signal, the improvement comprising converting both the digitalized main video signal and the digitalized correction signal to analogue signals, deriving an H and a V-detail signal from the analogue correction signal, adding the H and V-detail signals together, and adding the thus generated signal to the analogue main video signal as a contour correction signal.

4,360,831

MULTIPLE IMAGE DIGITAL PROCESSING SYSTEM

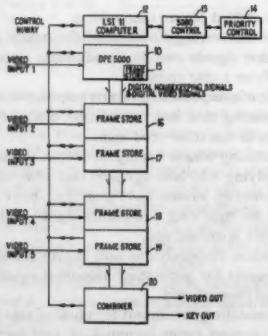
Paul R. N. Kellar, Newbury, England, assignor to Quantel Limited, Berkshire, England

Filed Nov. 7, 1980, Ser. No. 205,041

Claims priority, application United Kingdom, Nov. 16, 1979, 7939790

Int. Cl.³ H04N *5/22*

U.S. Cl. 358—182 **17 Claims**



1. A multiple picture image manipulation system comprising:

a plurality of frame storage means for respectively receiving video information related to a plurality of pictures;

means for designating the output priority order of the respective pictures from the respective frame storage means;

means for detecting picture information having the highest priority present for producing a control signal indicating this detected priority; and

selector means controlled by the signal from said detector means for selectively outputting information from the plurality of stored pictures held in said respective frame storage means so as to select from only a single picture designated with the highest priority present where picture overlap occurs to provide a multiple picture image in which one of the said pictures masks another without overlap degradation when displayed.

4,360,832

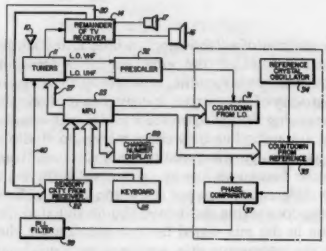
FREQUENCY SYNTHESIZER TUNING SYSTEM FOR TELEVISION RECEIVERS

Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Corporation, Franklin Park, Ill.

Filed Mar. 26, 1979, Ser. No. 23,692

Int. Cl.³ H04B *1/32;* **H04N** *5/44*

U.S. Cl. 358—191.1 **12 Claims**



1. A tuning system for the tuner of a television receiver capable of receiving a composite television signal and including frequency discriminator (AFT) circuit means, said system including in combination:

a reference oscillator providing a reference signal at a predetermined frequency;

a local oscillator in the tuner providing a variable output frequency in response to the application of a control signal thereto;

a programmable frequency divider means having first and second inputs coupled respectively to the output of said reference oscillator and said local oscillator for producing an signals on said first and second outputs having a frequencies which are a programmable fraction of the frequency of the signals applied to the inputs thereto;

phase comparator means having one input coupled with the first output of said programmable frequency divider means and having another input coupled with the second output of said programmable frequency divider for developing a control signal and applying such control signal to said local oscillator for controlling the output frequency thereof;

counter circuit means coupled with said programmable frequency divider means for initially setting said divider means to a predetermined division ratio and operating to change the programmable fraction of division thereof in accordance with changes in the count in said counter circuit means; and

control circuit means coupled with the output of said frequency discriminator means and further coupled with said counter circuit means for causing said counter circuit means to count in a predetermined direction determind by the state of the output signal from said discriminator means in the absence of a predetermined signal output from said frequency discriminator means until a predeter-

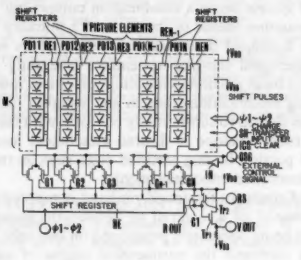
mined maximum count is attained, thereupon resetting said counter circuit means to a count which is a predetermined amount less than said maximum predetermined count and continuing to count in the same predetermined direction from said new count to continuously change the programmable fraction of said frequency divider in accordance with the state of operation of said counter, said control means operating in response to said predetermined signal output from the frequency discriminator means for terminating operation of said counter circuit means.

4,360,833

LIGHT SENSITIVE SEMI-CONDUCTOR ELEMENT AND ARRANGEMENT

Takao Kinoshita; Nobuhiko Shinoda, and Shinji Sakai, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1980, Ser. No. 206,487
Claims priority, application Japan, Nov. 15, 1979, 54-148616
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 **13 Claims**



1. A solid state semi-conductor element including:

a plurality of line sensors,

said line sensors each being arranged along a line and each sensor including a plurality of P-N junctions each of which accumulates a charge corresponding to the amount of light incident thereon;

a plurality of first register means,

said first register means corresponding one to one to said plurality of line sensors, each register means having a plurality of addresses, each address corresponding one to one with each P-N junction portion of the corresponding line sensor, the charge accumulated on each P-N junction portion being coupled for transfer to the respective address in each register means, and the charge signal transferred to the respective address of each register means being produced as a time-sequential signal from each register means by clock pulses;

a second register means,

said means having a plurality of addresses, each address being the same as the number of said first register means, each of the addresses of the second register means corresponding one to one to said first register means, the time-sequential output signals of the first register means being additively storable in the corresponding address of the second register means, and the signal stored in the second register means being able to be read out as a time-sequential signal; and

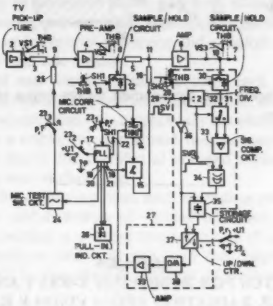
gate means between each output of said first register means and each address input of the second register means for selectively transferring the signal from said first register means to said second register means.

4,360,834

TELEVISION CAMERA COMPRISING A TELEVISION PICK-UP TUBE AND AN ANTI-MICROPHONICS CIRCUIT

Peter C. Schmale, Delft, and Hendrik Blom, Breda, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,460
Claims priority, application Netherlands, Aug. 1, 1979, 7905915
Int. Cl.³ H04N *5/34*
U.S. Cl. 358—217 **6 Claims**



1. A television camera having a camera signal channel including a television pick-up tube and an output terminal, and having an anti-microphonics circuit which includes a microphonics detection circuit, a microphonics correction circuit and an on-off switch for microphonics correction depending on whether or not microphonics noise is detected, characterized in that said microphonics detection circuit comprising a signal sample-and-hold circuit, coupled to said camera signal channel at a first connecting point, for processing a video signal which possibly contains a microphonics noise signal, and a phase-locked loop circuit having a voltage controlled oscillator therein coupled to said sample-and-hold circuit, a first output of said phase-locked loop circuit being connected to a switching signal input of said on-off switch, whereby, on the occurrence of a microphonics noise signal, said microphonics detection circuit produces a switching signal on the first output of said phase-locked loop circuit causing said on-off switch to close.

4,360,835

TELEVISION CAMERA OBJECTIVE HAVING DRIVING MECHANISM FOR ADJUSTING COMPONENTS OF ITS OPTICAL SYSTEM

Nobuo Matui, Hasuda, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

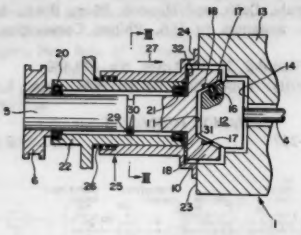
Filed Dec. 17, 1980, Ser. No. 217,122
Claims priority, application Japan, Dec. 24, 1979, 54-167938
Int. Cl.³ H04N *5/26*
U.S. Cl. 358—225 **15 Claims**

1. In a television camera objective having a transmission shaft to which a driving unit is adapted to be detachably connected and a driving mechanism for axially displacing at least one lens component of an optical system upon rotation of said transmission shaft; the improvement comprising:

means movable from a first position when said driving unit is dismounted from said transmission shaft to a second position when said driving unit is mounted on said transmission shaft, and

means releasably interconnecting said first-named means and said transmission shaft for preventing said transmission

shaft from rotating upon said first-named means being in said first position but allowing said transmission shaft to



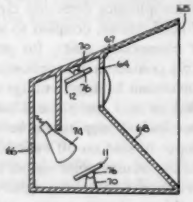
rotate upon said first-named means being in said second position.

4,360,836

APPARATUS FOR REMOVING X-RAYS AND OTHER HARMFUL RADIATION FROM VISIBLE RADIATION

Judy A. Breck, 330 E. 85 St., New York, N.Y. 10028, and Thomas W. Evans, New York, N.Y., assignors to Judy A. Breck, New York, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,576
Int. Cl.³ G21K *3/00*
U.S. Cl. 358—245 **36 Claims**



1. An apparatus which removes harmful radiation from the visible image producing radiation emitted by a cathode ray tube comprising:

a. image conveying means for conveying by reflectance the visible image originating from a cathode ray tube, said image conveying means being comprised of a reflective layer and an absorptive layer, said reflective layer being substantially reflective of visible electromagnetic radiation and substantially transmissive of electromagnetic radiation of wavelengths shorter than visible radiation, and said absorptive layer being comprised of a material capable of absorbing the electromagnetic radiation transmitted by said reflective layer; and

b. image receiving means for receiving the visible image conveyed by said image conveying means, said image receiving means being substantially reflective of visible electromagnetic radiation and substantially transmissive of electromagnetic radiation of wavelengths shorter than visible radiation; and

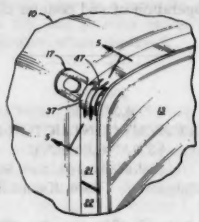
c. wherein said image conveying means and image receiving means are mounted in a housing by means which permit the adjustment of the position of said image receiving means relative to said image conveying means.

4,360,837

CATHODE RAY TUBE SUPPORT SYSTEM

James F. Kreidler; Ralph E. Neuber, both of Ottawa, Ohio, and Harry R. Swank, Waterloo, N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Jul. 11, 1980, Ser. No. 167,610
Int. Cl.³ H04N *5/65*; H01J *29/02*
U.S. Cl. 358—246 **11 Claims**



1. An improved cathode ray tube support system utilizing spaced-apart mounting means associated with an implosion-inhibiting tensioned encompassment of the forward region of the tube envelope adjacent the viewing area thereof, said improved system being a combination comprising:

tube mounting means in the form of a plurality of substantially L-shaped mounting bracket members each having an apertured ear-like appendage integrally upstanding from a basal portion evidencing upper and lower surfaces having modifications therein and whereof the lower surface is shaped to substantially conform with the contour of said tube envelope at desired attachment locations, said basal portion having inclined edge regions transverse to said tensioned encompassment;

a pair of similarly fashioned rimband components compatibly shaped of a material of defined thickness, said rimbands being oppositely positioned on said tube to contiguously surround the perimetrical region of said viewing area, each of said components having a plurality of designated arcuate attachment regions whereat said mounting bracket members are positioned; at least one of said bracket attachment regions having at least one longitudinally defined slit incised in said rimband material at said region to create a formation of demarcated parallel ribbon segments thereat, at least one of said segments being materially shaped in a selectively defined manner outward from the body plane of the rimband material to provide a ribbon-defined slot-like construction wherein the basal portion of said bracket is contiguously accommodated in a manner to permit a limited degree of lateral adjustment of said bracket at said attachment region to insure accurate orientation thereof; and

a one-piece banding strap superjacently positioned in a tube encompassing manner upon said related rimband components and said spatially associated mounting brackets, said strap being determinately tensioned thereabout to securely affix said rimband components and said positionally adjusted brackets while effecting implosion-resistant characteristics to said tube.

4,360,838

MEANS AND METHOD FOR MOUNTING CATHODE RAY PICTURE TUBES

Michael Babicz; Carl Campisi, and Joseph E. Josephs, all of Chicago, Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

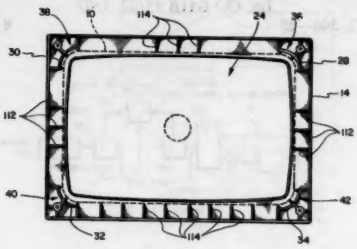
Filed Aug. 17, 1981, Ser. No. 293,076
Int. Cl.³ H04N *5/645*
U.S. Cl. 358—248 **6 Claims**

1. In a television receiver cabinet having frontal escutcheon means with an opening for conformally receiving and framing

a substantially rectangular cathode ray tube face panel of oversize circumference, improved centering and support means for said cathode ray tube comprising:

corner guide means rearwardly extending from said opening in said escutcheon means for guiding each corner of said face panel into said opening;

a plurality of tapered crush ribs projecting inwardly from each of said corner guide means for exerting a progressively increasing force fit on said face panel;



means for forcing said corners of said tube forwardly into said corner guide means and said tapered crush ribs;

retention means for retaining said corners in said corner guide means and said tube in said cabinet;

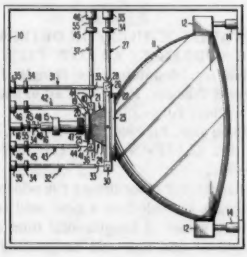
such that as said corners of said face panel are forced into said corner guide means, said tapered crush ribs yield and conform to the contours of said corners, effectively centering said tube in said escutcheon means and said cabinet, and providing for the firm retention of said tube in said cabinet.

4,360,839

DEFLECTION YOKE ADJUSTMENT APPARATUS

Frank R. Ragland, Jr., Lancaster, and Randall W. Martin, Narvon, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,132
Int. Cl.³ H01J *9/236*
U.S. Cl. 358—249 **9 Claims**



1. A deflection yoke adjustment apparatus, for use with a television display system comprising a color television kinescope including a neck having a longitudinal axis and incorporating means disposed within said kinescope neck for producing three electron beams, and a deflection yoke comprising horizontal deflection coils for deflecting said electron beams in horizontal directions orthogonal to said longitudinal axis and vertical deflection coils for deflecting said electron beams in vertical directions orthogonal to said longitudinal axis; said deflection yoke adjustment apparatus comprising:

a support structure receiving said kinescope and incorporating electrical means for energizing said kinescope;

a horizontal deflection coil holder for supporting said horizontal deflection coils, said holder having a side surface, a trio of rear surfaces, and a pair of bottom surfaces;

a plurality of moveable positioning rods coupled to respective ones of said surfaces of said holder for supporting said holder in such manner as to dispose said horizontal deflection coils in a location encircling said kinescope neck, with said side surface disposed at one side of said longitudinal axis, with two of said rear surfaces respectively disposed on opposite sides of said longitudinal axis, with the remaining one of said rear surfaces vertically displaced with respect to said longitudinal axis, and with said pair of bottom surfaces, respectively disposed on opposite sides of said longitudinal axis;

said plurality of moveable positioning rods including:

a first positioning rod extending substantially parallel to said directions of horizontal deflection and coupled at one end thereof to said side surface;

second, third and fourth positioning rods, each extending substantially parallel to said longitudinal axis, with each of said second and third rods respectively coupled at one end thereof to a respective one of said two rear surfaces, and with said fourth rod coupled at one end thereof to said remaining rear surface; and

fifth and sixth positioning rods, each extending substantially parallel to said directions of vertical deflection, with said fifth rod coupled at one end thereof to one of said pair of bottom surfaces, and with said sixth rod coupled at one end thereof to the other of said pair of bottom surfaces; and

a plurality of selectively operable actuating means mounted on said support structure for adjusting the orientation of said horizontal deflection coils with respect to said kinescope neck, each of said actuating means being coupled to the remaining end of a respectively different one of said plurality of positioning rods, with the actuating means coupled to said first positioning rod causing movement of said first rod in a direction substantially parallel to said directions of horizontal deflection when selectively operated, with the respective actuating means coupled to said second, third and fourth positioning rods causing movement of the respectively associated rod in a direction substantially parallel to said longitudinal axis when selectively operated, and with the respective actuating means coupled to said fifth and sixth rods causing movement of the respectively associated rod in a direction substantially parallel to said directions of vertical deflection when selectively operated.

4,360,840

REAL TIME DATA COMPRESSION/DECOMPRESSION SCHEME FOR FACSIMILE TRANSMISSION SYSTEM

Larry M. Wolfrum, Chicago, and Frederick C. Barrett, Vernon Hills, both of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed May 13, 1980, Ser. No. 149,362
Int. Cl.³ H04N *1/40, 7/12*
U.S. Cl. 358—261 **18 Claims**

1. A method of one-dimensional redundancy reduction coding, transmission and decoding of binary image data by use of an entropy preserving algorithm, the image data of the type including two-level pel representation of an image to be transmitted, comprising the steps of:

(a) generating an image definition comprising a serial stream of binary data bits, each bit representing a single pel of either a first level or a second level;

(b) assigning a predetermined binary code N having a number of data bits n representing a runlength of consecutive pels of a single level;

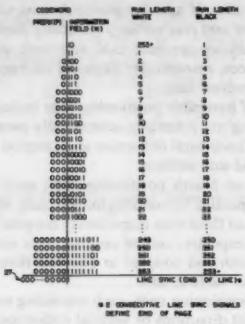
(c) assigning a prefix P for defining with N a codeword representation of a runlength, the prefix P having a number of data bits p, whereby the total number of data bits representing each runlength of pels is defined by a code-

word comprising a prefix P and a code N having (p+n) data bits;

(d) concatenating consecutive codewords;

(e) framing the concatenated codewords into output words W each having a fixed, predetermined number of data bits w;

(f) transmitting the output words; and



(g) receiving and decoding the transmitted output words for generating therefrom a serial stream of data bits, each bit representing a single pel of one of said levels, by searching in said output words for the prefix P associated with a codeword and identifying therefrom the (p+n) bits associated therewith.

4,360,841

DATA CORRECTION CIRCUIT

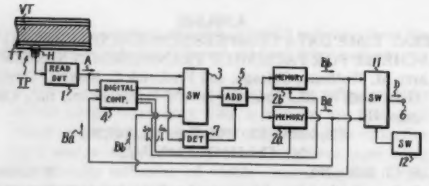
Michio Mita, Isehara, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 24, 1980, Ser. No. 220,094

Claims priority, application Japan, Dec. 25, 1979, 54-168640

Int. Cl.³ G11B *27/02, 15/18*

U.S. Cl. 360—13 **6 Claims**



1. A data correction circuit for correcting errors in a sequence of generally regularly and progressively incremented input data comprising input circuit means for receiving the input data; first memory means for storing data; second memory means for storing data; incrementing means for incrementing data supplied thereto in a selected one of positive and negative senses and supplying the incremented data therefrom to said first and said second memory means; comparing means for comparing the data stored in said first memory means with said input data; switch means controlled by said comparing means for selectively supplying said incrementing means with one of said input data and the data stored in said second memory means; and output means coupled to at least said second memory means for providing corrected output data.

4,360,842

DATA PROCESSOR FOR RECORDING AND READING OUT CHECK DATA AND TRUE DATA IN A CASSETTE TAPE

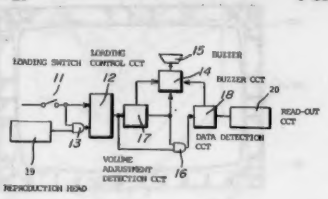
Soichi Onishi, Yao, and Shigeru Kitano, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 82,333, Oct. 5, 1979. This application Feb. 6, 1981, Ser. No. 231,993

Claims priority, application Japan, Oct. 11, 1978, 53-125308; Oct. 11, 1978, 53-139741[U]

Int. Cl.³ G11B *15/02, 5/02*

U.S. Cl. 360—25 **8 Claims**



1. A data reader for reading out data in the form of signals contained on a magnetic tape comprising:

reproduction head means for recalling information stored on said magnetic tape;

means for initiating the read out of said information;

control circuit means for variably amplifying said information recalled by said reproduction head means and producing an amplified output;

volume level detection means receiving said amplified output and determining whether said amplified output has a signal level sufficient for proper readout;

means for providing an indication of an insufficient signal level in response to a determination by said volume level detection means that said signal level is insufficient;

data detection means for determining whether said information contained in said amplified output is actual data, said data detection means being operatively connected to said control circuit means only when said amplified output has a signal level sufficient for proper readout as determined by said volume level detection means.

4,360,843

APPARATUS AND METHOD FOR DETERMINING TIME CODE ADDRESSES AT LOW TAPE SPEED

William A. Menezes, Mountain View; Douglas D. Kuper, Campbell, and David Wheeler, Palo Alto, all of Calif., assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 139,748

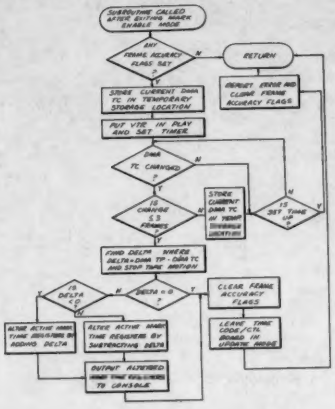
Int. Cl.³ H04N *5/78;* G11B *27/14*

U.S. Cl. 360—72.2 **24 Claims**

1. In an apparatus for determining the addresses of selected information signals recorded on a tape, said tape also having recorded on it a series of longitudinal time codes recorded along the length of said tape and designating corresponding addresses of recorded information signals, and a series of control pulses which are recorded serially along said tape and being reproduced for the purpose of synchronizing the motion of said tape relative to transducer means which reads said information signals on said tape, said apparatus including time code reading means capable of reliable reading said longitudinal time codes only when said tape is moved at a speed which is sufficient therefor, selectively operable means for generating a marking signal when an information signal recorded at a desired point of said tape is read, and control pulse reading means for reproducing said control pulses as said tape moves; a device for determining the address, in terms of its respective longitudinal time code, of a selected information signal when the latter is selected at a time when the tape is not being moved

at said speed sufficient for reliable reading of said longitudinal time codes, said device comprising:

speed-up means operable for increasing the speed of said tape after generation of marking signal so that said tape attains a sufficient speed for said time code reading means to reliably read a subsequently encountered longitudinal time code;


SUBROUTINE CALLED AFTER EDITING MARK ENABLE MODE
RETURN
STORE CURRENT DATA TC IN TEMPORARY STORAGE LOCATION
RESET ERROR AND CLOSE FRAME ACCURACY FLAGS
PUT VTR IN PLAY AND SET TIMER
DATA TC CHANGED
STORE CURRENT DATA TC IN TEMP STORAGE LOCATION
SET TIME UP
FIND DELTA WHERE DELTA=DATA TP - DATA TC AND STOP TIME BRITAIN
DELTA = 0
CLEAR FRAME ACCURACY FLAGS
ALTER ACTIVE MARK TIME REQUIRED BY SWITCHING DELTA
OUTPUT ALTERED

counting means for counting said control pulses reproduced by said control pulse reading means between said generation of said marking signal and the reliable reading of said subsequently encountered longitudinal time code and thereby providing a count of said control pulses; and

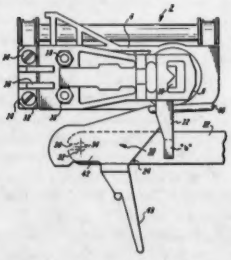
means for providing a derived address, in terms of its respective longitudinal time code, which is a function of said count and of said subsequently encountered longitudinal time code and which corresponds to said desired point.

4,360,844

HEAD INTERLOCK MECHANISM

Michael A. Maiers, Sunnyvale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 13, 1980, Ser. No. 159,261
Int. Cl.³ G11B 5/016
U.S. Cl. 360—99 **3 Claims**



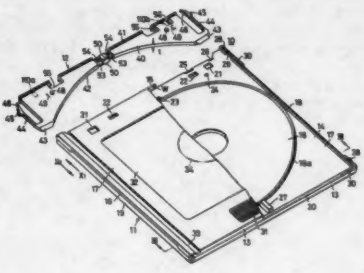
1. In a disc drive for recording data on, or read data from, a pliant magnetic disc, including at least one moveable transducer head and at least one fixed transducer head, and means for exerting a force on said moveable transducer head which force accomplishes loading of said heads upon opposite surfaces of a magnetic disc inserted therebetween, the improvement comprising a rotatable force biased head interlock mechanism including a first portion positioned in alignment with a secton of said at least one moveable transducer head when a magnetic disc is not inserted substantially fully into the disc drive whereby said heads cannot contact without a magnetic disc within the disc drive and a second portion positioned to be contacted by a magnetic disc when such magnetic disc is inserted substantially fully into the disc drive whereby the magnetic disc causes the head interlock mechanism to rotate such that said first portion of said interlock means is no longer aligned with said section of said at least one moveable transducer head whereby said heads can achieve their operating position, said head interlock mechanism returning under the action of the force bias to the position in which said first portion of said head interlock mechanism is in alignment with said section of said at least one moveable transducer head when a magnetic disc is not inserted substantially fully into the disc drive.

4,360,845

CASE FOR A DISC-SHAPED RECORDING MEDIUM

Osamu Tajima, Kanagawa; Takashi Yamamura, Yokohama; Masafumi Mochizuki, Yamato, and Yoichi Mita, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 28, 1981, Ser. No. 229,303
Claims priority, application Japan, Feb. 1, 1980, 55-11278
Int. Cl.³ G11B 5/82, 25/04
U.S. Cl. 360—133 **13 Claims**



1. A case for a disc-shaped recording medium used in a disc-shaped recording medium reproducing apparatus, said reproducing apparatus being provided with an insertion opening through which said case is inserted, a turntable for rotating said disc-shaped recording medium, a lid plate locking member and a disc-shaped recording medium clamping member provided at the innermost part of said disc-shaped recording medium reproducing apparatus opposite to said insertion opening with respect to said turntable, and a jacket opening enlarging member provided in the vicinity of said insertion opening, capable of moving between the position in the vicinity of said insertion opening and said innermost part of said disc-shaped recording medium reproducing apparatus above said turntable, said case comprising:

a jacket having a space for accommodating said disc-shaped recording medium and an opening for allowing said disc-shaped recording medium to go in and out of said jacket; and

a lid plate inserted through said opening of said jacket for closing said opening of said jacket,

said lid plate having cutouts wherein said jacket opening enlarging member and said lid plate locking member enter,

said opening of said jacket being enlarged by said jacket opening enlarging member within said cutouts of said lid plate upon insertion of said jacket inside said reproducing apparatus through said insertion opening,

said lid plate being locked by said lid plate locking member within said cutouts of said lid plate upon insertion into said innermost part of said reproducing apparatus together with said jacket,

said lid plate further having a ride-over part for allowing said disc-shaped recording medium clamping member to ride over said lid plate and enter from the enlarged opening of said jacket and clamp said disc-shaped recording medium inside said jacket upon insertion of said lid plate into said innermost part of said reproducing apparatus together with said jacket, and

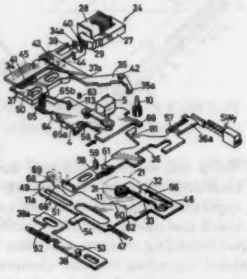
said jacket being pulled out in an empty state leaving behind said lid plate locked by said lid plate locking member and said disc-shaped recording medium clamped by said disc-shaped recording medium clamping member, when said jacket is pulled out from within said reproducing apparatus in a direction opposite to the direction of the insertion.

4,360,846

OPERATING MODE CHANGE-OVER APPARATUS IN TAPE RECORDING AND/OR REPRODUCING APPARATUS

Toshio Asai; Toshiro Ohta, both of Tokyo; Kunio Shimizu, Funabashi, and Tetsuji Nakazawa, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1979, Ser. No. 105,299
Claims priority, application Japan, Dec. 29, 1978, 53-162459
Int. Cl.³ G11B *15/10*
U.S. Cl. 360—137 **14 Claims**



1. An operating mode change-over mechanism for use in a tape recording and/or reproducing apparatus comprising:

at least one plunger-solenoid having a stationary iron core and a movable iron core.

said movable iron core movable from a first position in contact with said stationary iron core to a second position spaced from said stationary iron core,

a drive motor,

a pinion driven by said drive motor,

a rack member movable from a first position in engagement with said pinion to a second position disengaged from said rack,

operating mode change-over means driven by said rack from a first inoperative position to a second mode change initiating position when said rack is in said first position,

locking means driven by said movable iron core to hold said rack in said first position when said movable iron core is in its said first position, and

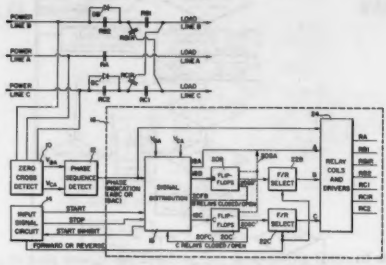
spring means to urge said movable iron core into its said first position against said stationary iron core whereby while said movable iron core is in its said first position said plunger-solenoid is energized and said drive motor is driven.

4,360,847

DIODE ASSISTED RELAY CONTACTOR

Milton D. Bloomer, Scotia; Joseph L. Ciccone, Albany; John D. Harnden, Jr.; William P. Kornrumpf, both of Schenectady, and Donald P. Shattuck, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,410
Int. Cl.³ H02H *3/00*
U.S. Cl. 361—3 **25 Claims**



1. A method of switchably connecting and disconnecting first, second and third output lines of a threephase AC power source to first, second and third input lines of a load, the steps comprising:

I. turning on a flow of power from said AC power source to said load by:

(a) making an ohmically-isolated pair of first-line relay contacts, to establish a direct two-way current conduction path between said first output line of said AC power source and said first input line of said load;

(b) making an ohmically-isolated pair of second-line pilot relay contacts after, or at the same time as, step I(a), to establish a one-way current conduction path through a second-line diode between said second output line of said AC power source and said second input line of said load, the second-line pilot relay contacts making only when the second-line diode is reversed-biased by said AC power source;

(c) making a pair of second-line master relay contacts shunted by, and associated with, said second-line diode after step i(b) and only when the second-line diode is forward biased by said AC power source, to establish a two-way current conduction path between said second output line of said AC power source and said second input line of said load;

(d) making an ohmically-isolated pair of third-line pilot relay contacts after, or at the same time as, step I(a), to establish a one-way current conduction path through a third-line diode between said third output line of said AC power source and said third input line of said load, the third-line pilot relay contacts making only when the third-line diode is reverse biased by the AC power source; and

(e) making a pair of third-line master relay contacts shunted by, and associated with, said third-line diode after step I(d) and only when the third-line diode is forward biased by said AC power source, to establish a two-way current conduction path between said third output line of said AC power source and said third input line of said load; and

II. turning off the flow of power from said AC power source to said load by:

(a) breaking one of said pairs of second-line and third-line master relay contacts when the associated shunting diode is forward biased by the AC power source;

(b) breaking the pair of pilot relay contacts associated with the master relay contacts of step II(a) after step II(a) and only when the associated line diode is reverse biased;

(c) breaking the other one of said pairs of second-line and third-line master relay contacts only when the associated

line diode is forward biased by the AC power source; source;

(d) breaking the other one of said pairs of pilot relay contacts after step II(c) and only when the associated line diode is reverse biased;

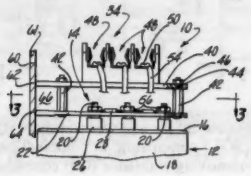
(e) breaking the pair of first-line relay contacts after, or at the same time as, the last occuring of steps II(b) and II(d).

4,360,848

CAPACITOR PROTECTIVE DEVICE

Theodore E. Noutko, 10467 Lee Ann Ct., Brighton, Mich. 48116; Steve D. Toms, 2137 Webster Park, and David P. Light, 8058 Hemingway, both of Howell, Mich. 48843

Filed Jun. 18, 1980, Ser. No. 160,685
Int. Cl.³ H02H 7/16
U.S. Cl. 361—15 **7 Claims**



1. A protective assembly for a capacitor of the type having a plurality of electrical terminals extending outwardly from one side of the capacitor in which said electrical terminals are adapted for detachable electrical connection with an electrical circuit, said protective assembly comprising:

a mounting plate constructed of an electrical insulating material, said mounting plate having a plurality of apertures formed through it which register with said electrical terminals, said mounting plate to be positioned on said one side of said capacitor so that said terminals extend through said mounting plate apertures whereupon one side of said plate faces said one side of the capacitor while said terminals protrude outwardly from the other side of the plate,

means for detachably securing said mounting plate to the capacitor terminals,

a further plate and means for securing said further plate to said mounting plate so that said further plate is substantially parallel to and spaced outwardly from said other side of the mounting plate,

a fuse assembly secured to said further plate, said fuse assembly comprising at least one fuse holder having at least two electrical fuse terminals, and

means for electrically connecting at least one fuse terminal to at least one capacitor terminal.

4,360,849

POWER DISTRIBUTION SYSTEM

David L. Harris, New Berlin; Daniel T. Elwing, and Howard T. Jones, both of Waukesha, all of Wis., assignors to RTE-ASEA Corporation, Waukesha, Wis.

Filed Mar. 4, 1981, Ser. No. 240,342
Int. Cl.³ H02H 7/04
U.S. Cl. 361—39 **23 Claims**

1. A power delivery system comprising a transformer module and a feeder module,

said transformer module including a transformer tank,

insulating oil in said tank and

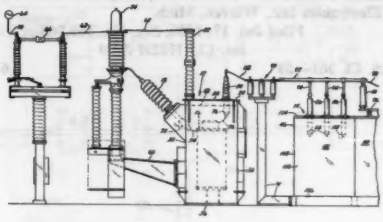
a transformer having primary and secondary windings immersed in said oil in said tank;

means mounted on said tank for connecting said primary winding to a power source, said means including a primary bushing mounted on the sidewall of said tank,

a circuit breaker mounted on the sidewall of said tank adjacent to said primary bushing, conductive means connecting said circuit breaker to said primary bushing,

a lightning arrester mounted on the top of said tank in close proximity to said primary bushing and means connecting said lightning arrester to said circuit breaker on the power source side of said circuit breaker; and

a number of secondary bushings mounted on said tank;



said feeder module including a housing having a transition cubicle and a feeder cubicle,

electrically conductive means connecting said secondary bushing to said transition cubicle, and

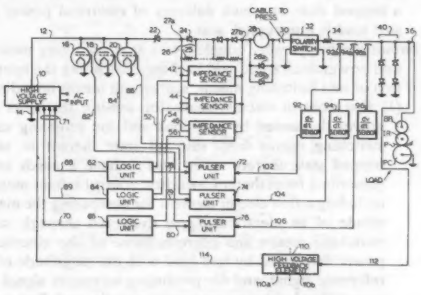
electrically conductive insulated cable assembly means connecting said transition cubicle to said feeder cubicle.

4,360,850

INTRINSICALLY SAFE ELECTROSTATIC ASSIST UNITS

Velmar E. Howard, Veddersburg, Ind.; Keith K. Klett, Danville, Ill.; Ernest A. Sammann, Urbana, Ill., and Joseph T. Verdeyen, Champaign, Ill., assignors to HurletronAltair, Inc., Danville, Ill.

Filed Oct. 30, 1979, Ser. No. 89,309
Int. Cl.³ H02H 9/00
U.S. Cl. 361—56 **33 Claims**



1. An improved electroassist printing system to safely apply a high voltage, generated by a power supply with two high voltage terminals, to a load including selected cylinders of a printing press, the improvement comprising:

first means for sensing, to sense the impedance of the load essentially independent of load current;

said first means for sensing includes first and second voltage divider means and means for comparing, said first and second voltage divider means are respectively connected between first and second selected nodes and a reference node, said means for comparing is connected between third and fourth nodes selectively located respectively on said first and second voltage divider means;

first means for generating, connected to said first means for sensing, to generate a first signal, indicating that the load impedance has fallen below a selected value; and

means for switching connected in parallel with the output terminals of the power supply, to sense said first signal and

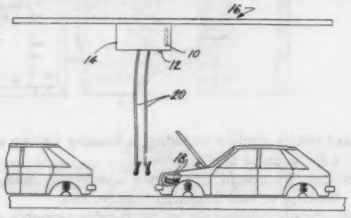
to switch from a non-conducting state to a conducting state to quickly provide a low impedance path between the terminals of the power supply thereby reducing the voltage applied to the load.

4,360,851

ELECTRONIC CIRCUIT BREAKER

Andrew T. Zundel, Warren, Mich., assignor to Portable Tool & Electronics Inc., Warren, Mich.

Filed Jul. 17, 1980, Ser. No. 169,560
Int. Cl.³ H02H 3/26
U.S. Cl. 361—59 **6 Claims**



1. A device for interrupting delivery of electrical power to a load when said load demands electrical power in excess of a prescribed level thereof and is automatically reset to resume delivery of electrical power when said load is disconnected from said device, comprising:

terminal means adapted for connecting said load with a source of electrical power;

actuatable switching means operably coupled with said terminal means for selectively interrupting the delivery of electrical power from said source to said load, said switching means being actuatable between a set state in which electrical power is delivered therethrough to said load and a tripped state in which delivery of electrical power to said load is interrupted; and

circuit means operably coupled with said switching means, said power source and said load for controlling the operation of said switching means, said circuit means including:

(1) first control circuit means for sensing the level of power demanded by said load and for actuating said switching means from said set state thereof to said tripped state thereof when said demand exceeds said prescribed level thereof, said first control circuit means including a first circuit element for comparing the magnitude of an electrical signal delivered through said switching means and representative of the electrical power demanded by said load with the magnitude of a reference signal, and for producing an output signal in accordance with the compared signals, and first and second interconnected electrical switches, said first switch being connected with said first circuit element for receiving said output signal therefrom, said second switch being connected with said switching means for selectively actuating the latter, and

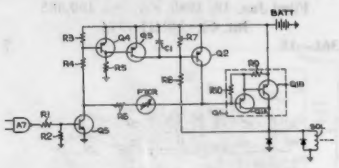
(2) second control circuit means operably coupled with said first control circuit means for actuating said switching means from said tripped state to said set state thereof in response to the disconnection of said load from said device, said second control circuit means including a second circuit element operably coupled with said second switch and operable for comparing the magnitude of an electrical signal derived from said load and representative of the electrical power demanded by said load with the magnitude of a reference signal, and for producing a control signal for delivery to said second switch in accordance with the compared signals, said control signal being operative for causing said second switch to actuate said switching means from said tripped state thereof to said set state thereof.

4,360,852

OVERCURRENT AND OVERTEMPERATURE PROTECTIVE CIRCUIT FOR POWER TRANSISTOR SYSTEM

Thomas P. Gilmore, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 1, 1981, Ser. No. 249,850
Int. Cl.³ H02H 3/10
U.S. Cl. 361—98 **8 Claims**



1. A protective circuit for a power transistor (Q1) adapted to switch a load (SOL) comprising, in combination,

a base-drive-removing transistor (Q2) connected in shunt to the base-emitter junction of said power transistor (Q1),

an RC circuit including a capacitor (C1) connected in series with a resistance (R8) across the collector-emitter junction of said power transistor (Q1) with said capacitor (C1) in shunt to the base-emitter junction of said base-drive-removing transistor (Q2),

a forward-biased shunting transistor (Q3) connected across said capacitor (C1), and

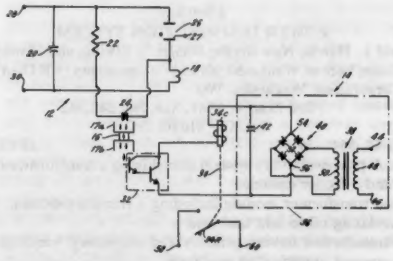
switch turn-on transistor means (Q5, Q4) triggerable to the conductive state by a turn-on signal for removing forward bias from said shunting transistor (Q3) to permit said capacitor (C1) to charge and for applying base drive to said power transistor (Q1) to switch it on and thereby energize said load, whereby said capacitor (C1) can charge from excessive voltage across said power transistor (Q1) and turn on said base-drive-removing transistor (Q2) to thereby remove base current from said power transistor and turn it off.

4,360,853

CAPACITOR VOLTAGE AND TRIP COIL IMPEDANCE SENSOR WITH HIGH VOLTAGE ISOLATION

Steven Welk, Lansdale, Pa., assignor to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed Aug. 19, 1981, Ser. No. 294,147
Int. Cl.³ H01H 3/26
U.S. Cl. 361—115 **9 Claims**



1. A capacitor voltage and trip coil impedance sensor with high voltage isolation, and sensor comprising:

a trip coil;

capacitor means for storing a charge for rapid discharge through said trip coil;

resistance means;

photo-diode means connected in series with said trip coil, said capacitor means and said resistance means to define a current loop therewith, said photo-diode means being for generating a light signal representative of the current pasing through said photo-diode means at each instant, whereby when a d.c. voltage is applied across said capacitor means to maintain a constant voltage thereacross, a constant direct current will flow through said current loop, and said photo-diode means will generate a light signal representative of the magnitude thereof;

status indicating circuit means for indicating the amount of current passing through said photo-diode means at each instant responsive to said light signal, said status indicating means being electrically isolated from said current loop; and

electrically insulative optically transmissive means for conveying said light signal from said photo-diode means to said status indicating circuit means.

4,360,854

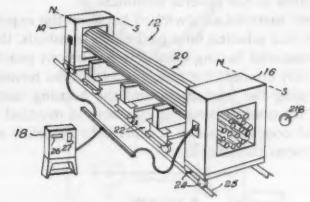
DEMAGNETIZING, VARIABLE FREQUENCY

Mark Schergen, Des Plaines, and Joseph A. Armond, River Forest, both of Ill., assignors to Electro-Matic Products Co., Chicago, Ill.

Filed Dec. 12, 1980, Ser. No. 215,569

Int. Cl.³ H01F *13/00*

U.S. Cl. 361—149 **11 Claims**



1. Demagnetizing apparatus comprising,

circuitry adapted for connection with a source of current and operably interconnecting the components hereinafter set out, one of the components including demagnetizing coils, the circuitry being operable for transmitting DC to the demagnetizing coils, the coils being adapted for cooperation with a magnetized piece and operable for demagnetizing the piece,

voltage reducing means operable through a range from a condition enabling full voltage to be applied to the coils to a condition in which substantially zero voltage is so applied,

polarity reversing means operable through a predetermined range and including reversing switch means for reversing the DC in successive reversals throughout its range,

cycling means operable through a predetermined range, for operating the voltage means and the polarity reversing means, and

adjusting means for adjustably varying the range of each the voltage reducing means and the polarity reversing means independently of the cycling means.

4,360,855

INJECTOR DRIVE CIRCUIT

Masahiro Ohba, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 21, 1980, Ser. No. 209,120

Claims priority, application Japan, Nov. 27, 1979, 54-154028

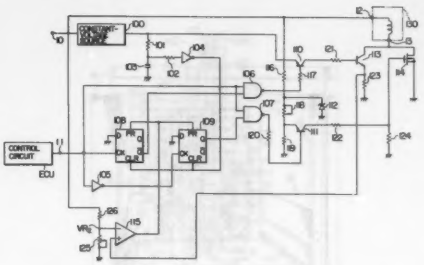
Int. Cl.³ H01H *47/32*

U.S. Cl. 361—154 **6 Claims**

2. An injector drive circuit for an injector opened in response to an electrical pulse signal with a time width corresponding to the amount of the fuel to be supplied to the engine comprising:

a field effect transistor having a drain-source path connected in series with said injector for supplying current to said injector; and

a switching circuit for determining whether a first predetermined current is supplied to said injector after the rise of



said electrical pulse signal, and for fixing current through said field effect transistor to a fixed second predetermined level by holding the gate potential of said field effect transistor at a predetermined set potential level corresponding to said second predetermined level for a time period during which said electrical pulse signal is produced after said first predetermined current is supplied to said injector.

4,360,856

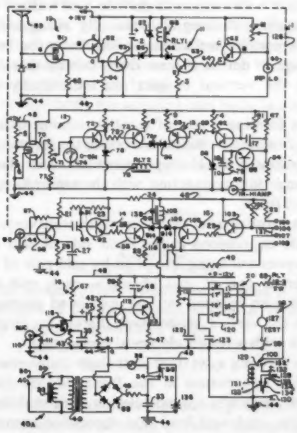
ELECTRIC SENSOR PACKAGE

Ira L. Witthaus, 310 E. Walton, Warrenton, Mo. 63383

Filed Jan. 8, 1981, Ser. No. 223,415

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—170 **5 Claims**



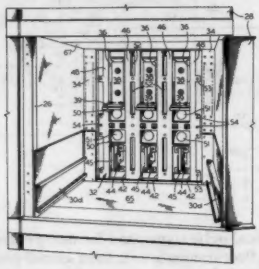
1. An electronic sensor package comprising at least six sensor-amplifier circuits each adapted to be electrically connected to a different condition responsive device and each electrically connected directly to a relay for energizing said relay, each of said relays being electrically connected to at least two of said sensor-amplifier circuits whereby the number of relays to which said sensor-amplifier circuits are connected is no more than half the number of sensor-amplifier circuits, said relays being electrically connected to a timing circuit electrically connected to signal or control means, or both.

4,360,857

MODULAR INSULATIVE SUPPORT BASE FOR ELECTRICAL SWITCHGEAR

William F. Olashaw, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 10, 1980, Ser. No. 214,851
Int. Cl.³ H02B 1/20
U.S. Cl. 361—361 8 Claims



1. In an electrical distribution equipment utilizing H-shaped vertical busbars for distributing electrical power to a plurality of loads via electrical devices accommodated in a stacked array of cubicles, a plurality of modular, structurally rigid, insulative support bases, each comprising in combination:

A. a rectangular, generally planar structure having marginal side edge portions for mounting said bases to the equipment framework in vertical end-to-end relation such as to constitute a succession of cubicle backwalls;

B. a plurality of integral, vertically elongated, laterally spaced, parallel walls outstanding from the back side of said base to define at least three side-by-side channels in which the vertical busbars are individually accommodated;

C. means forming a pair of parallel running troughs in the floor of each said channel accepting the forwardly extending portions of the H-shaped vertical busbar flanges while the flange interconnecting web thereof rests against said channel floor;

D. means forming a set of at least three transversely aligned, line-side depressions in the front side of said base, each said depression being straddled by said pair of troughs in a different one of said channels, each said depression including an opening into its associated channel floor to expose the vertical busbar web thereat for electrical connection with a run-in electrical connector;

E. means forming a set of at least three transversely aligned load-side depressions in the front side of said base in aligned, vertically spaced relation with said line-side depressions, each said load-side depression communicating with the open interior of a sleeve integrally formed with said base and extending rearwardly into the associated one of said channels through a gap in the web of the vertical busbar therein;

F. vertical arrays of preformed holes in the floors of said channels which accomodate bolts clamping the webs of the vertical busbars to said base; and

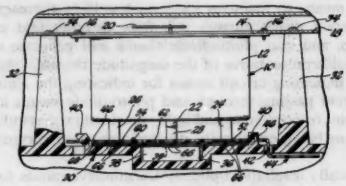
G. means provided in said load-side depressions for mounting runback connectors extending rearwardly through said sleeves in isolated relation with the vertical busbars.

4,360,858

INSTRUMENT PANEL ASSEMBLY WITH CONDUCTIVE ELASTOMERIC CONNECTORS

Waldo C. Fahling, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1981, Ser. No. 224,847
Int. Cl.³ H05K 7/12, 1/08
U.S. Cl. 361—380 4 Claims



1. A compact instrument assembly having simple assembly techniques therefor comprising

an instrument having rearwardly projecting terminals electrically connected to the instrument,

a substantially rigid housing member positioned rearwardly of the instrument,

an electrical component between the housing member and the instrument having terminals for electrical connection to the instrument terminals,

a printed circuit between the housing member and the instrument having exposed conductors for selective electrical connection to the several terminals,

elastomeric material sandwiched between the exposed conductors and selected ones of the said terminals, the elastomeric material having conductive portions positioned to selectively connect the conductors and the terminals, and

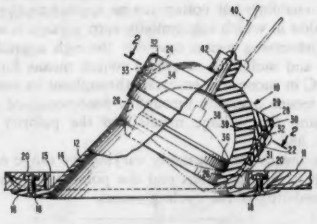
means urging the instrument and the housing member together for compressing the elastomeric material between the said conductors and terminals to establish electrical connections therebetween.

4,360,859

BOAT LIGHT HAVING RESILIENTLY FLEXIBLE AND ADJUSTABLE MOUNT

Theodore Ziaylek, Jr., 140 Riverview Dr., Yardley, Pa. 19067

Continuation-in-part of Ser. No. 872,522, Jan. 26, 1978, Pat. No. 4,245,281. This application Nov. 6, 1980, Ser. No. 204,449
Int. Cl.³ B60Q 1/04, 1/06, 1/24
U.S. Cl. 362—80 11 Claims



1. A boat light assembly comprising:

(a) a shield adapted for mounting upon a boat hull;

(b) a cup-shaped lamp unit retaining member formed of a soft flexible material extending within the shield;

(c) a lamp unit carried by said member;

(d) a mounting ring carired by the shield and receiving said member, said ring being formed of a soft flexible material and extending about the retaining member in engagement therewith, said retaining member, shield, and ring providing a ball-and-socket mounting in which the retaining

member forms the ball and the shield and ring form a mating socket in which said member is mounted for limited adjustment in any of various selected directions each having a horizontal and/or a vertical component; and

(e) means for radially contracting the mounting ring into gripping engagement with the retaining member in selected positions to which the retaining member is adjusted, to an extent effective for flexure of the retaining member and ring into frictional locking engagement with each other.

4,360,860

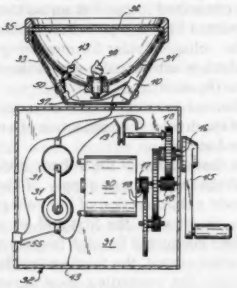
SELF-CONTAINED HAND HELD PORTABLE LANTERN-FLASHLIGHT CONSISTING OF A MANUALLY OPERATED GENERATOR AND RECHARGEABLE BATTERIES

Hugh G. Johnson, Ridge Rd., Laurel Hollow, Syosset, N.Y. 11791, and Burton C. Trattner, 160 Cedar St., Hempstead, N.Y. 11550

Continuation of Ser. No. 775,149, Mar. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 769,137, Feb. 15, 1977, abandoned, which is a continuation of Ser. No. 553,954, Feb. 28, 1975, abandoned. This application Nov. 13, 1979, Ser. No. 93,777

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—192 **2 Claims**



1. A portable electric device, comprising

a. a generator including a rotatable operating shaft,

b. crank means adapted to be actuated by an operator,

c. gear means coupling said crank means to said shaft,

d. rechargeable pressure vented nickel cadmium battery means,

e. means connecting said generator to said battery means,

f. an electric load device,

g. means for connecting said electric load device to said battery means,

h. the mechanical parameters of said generator, crank means, gear means, and the electrical parameters of said battery means being selected to preclude an operator from charging said battery means in a single continuous operation above a selected level substantially less than the total capacity of said battery means within a predetermined finite time period, and

i. a casing containing said generator, gear means, and said battery menas, said crank being external to said casing, said casing including two spaced-apart hand grips extending parallel to the axis of rotation of said crank, one of said hand grips constituting means to be grasped by one hand of an operator so that the forearm of the operator is substantially perpendicular to said hand grip being grasped during cranking of said crank and the other of said hand grips positioned to butt against the wrist of the hand grasping said one hand grip, thereby to oppose torque generated during cranking.

4,360,861

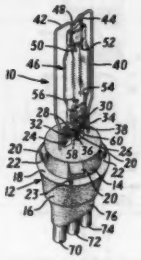
BASELESS LAMP SOCKET

James J. Fitzgerald, Kinnelon, N.J., assignor to Edison International, Rolling Meadows, Ill.

Filed Jul. 28, 1980, Ser. No. 172,837

Int. Cl.³ F21M *3/30*

U.S. Cl. 362—211 **29 Claims**



18. A baseless cartridge lamp and socket therefor comprising:

(a) a baseless cartridge lamp having two filament support exposed pins at one end and a filament support loop exposed at the other end thereof;

(b) a body;

(c) two socket pins extending from said body a first distance, said two socket pins being electrically conducting and operative at one end thereof to engage said two filament-support pins of said baseless cartridge lamp;

(d) a supporting contact;

(e) said supporting contact being an electrically conducting loop extending a second distance from said body in substantially the same direction as said two socket pins;

(f) means on said supporting contact for engaging said filament support loop of said cartridge lamp;

(g) said two socket pins and said means for engaging being operative to suspend said cartridge lamp between said socket pins and said supporting contact; said lamp being suspending axially in relation to said body;

(h) means on said body for securing said body in a cooperating holder; and

(i) means for respectively electrically connecting said two socket pins and said supporting contact to external sources of electrical power.

4,360,862

NAUTICAL LIGHT

Frederick G. Strasser, New Britain, and Elwood R. Horwinski, Cheshire, both of Conn., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

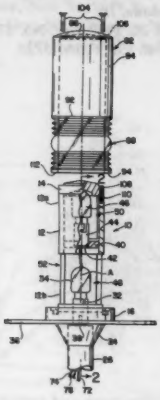
Filed Dec. 12, 1980, Ser. No. 215,880

Int. Cl.³ F21V *1/00*

U.S. Cl. 362—240 **21 Claims**

1. A nautical light comprising housing means including a cylindrical tubular metal body portion having an axis and axially opposite ends, mounting means for said housing means at one of said opposite ends thereof, said housing means further including transversely extending metal wall means axially spaced apart from one another and interconnected with said tubular metal body portion, said tubular metal body portion and wall means together providing cylindrical light chamber means in said housing, means supporting lamp bulb means in said light chamber means coaxial with said axis, said tubular metal body portion having window means opening radially therethrough into said light chamber means, said window means including circumferentially spaced apart side edges,

cylindrical lens means surrounding said tubular metal body portion between said opposite ends thereof, sealing means



between said lens means and housing means, and means removably mounting said lens means on said housing means.

4,360,863

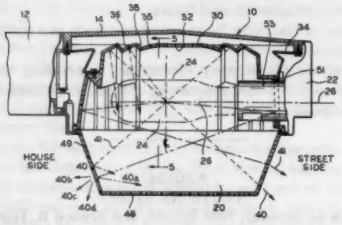
LUMINAIRE FOR RESIDENTIAL ROADWAY LIGHTING

Jocelyn T. Barnes; Chester A. Hard, III, both of Charlevoix, Mich.; Billy L. Shelby, Memphis, and Charles H. Loch, Germantown, both of Tenn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 919,938, Jun. 28, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,829

Int. Cl.³ F21V *7/09*

U.S. Cl. 362—346 **5 Claims**



1. A one piece reflector for use in a luminaire, said reflector having a top wall with side walls essentially rectangularly oriented about a light source with said walls symmetrical about the centerline of the light source to form an open bottom reflector structure with rectangular corners, said walls comprising a stepped parabolic specular reflector producing at least two collimated beams on each side of said centerline, each side wall of the reflector including a plurality of internal steps adjacent the corners of the housing with an internally concave continuous midsection, each said step being generally perpendicular to the axis of the light source, the top wall having an outwardly domed arcuate midsection with essentially flat lateral sections outwardly of the domed section, said domed section including arcuate steps adjacent the axial ends of the centerline to combine with said sidewalls to produce said at least two collimated beams along each lateral side wall.

4,360,864

VOLTAGE DIVIDER FOR A THYRISTOR VALVE CONTROL CIRCUIT

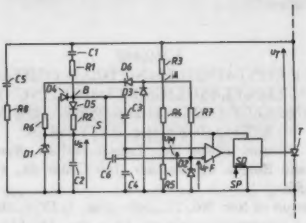
Gunnar Asplund, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Nov. 12, 1980, Ser. No. 206,204

Claims priority, application Sweden, Dec. 20, 1979, 7910516

Int. Cl.³ H02M *1/08*

U.S. Cl. 363—68 **10 Claims**



1. In a converter valve having at least one thyristor and a control circuit for firing the thyristor, a voltage distribution circuit comprising:

voltage dividing means, having a plurality of interconnected sections, connected in parallel across the thyristor;

means connected between preselected points of a first section of the voltage divider for measuring a voltage thereacross which is substantially proportional to the voltage across the thyristor; and

means connected between points of a second preselected section of the divider for connection of a supply voltage to the control circuit;

wherein the first section of the voltage divider is connected for low frequency voltage supply of the control circuit and wherein a third section of the voltage divider is connected in circuit with the first and second sections, the third section connected for high frequency voltage supply of the control circuit, the third section having a junction point therein for permitting measurement of high frequency voltage of the thyristor.

4,360,865

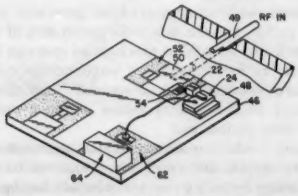
BROAD BAND MICROWAVE DETECTOR

Gary Yasumura, Santa Clara; Robert D. Genin, San Jose, and Scott F. Wetenkamp, Los Altos, all of Calif., assignors to Pacific Measurements, Inc., Sunnyvale, Calif.

Filed Feb. 24, 1981, Ser. No. 237,715

Int. Cl.³ H02M *7/06*

U.S. Cl. 363—126 **9 Claims**



1. An improved broad-band microwave detector, having an input port, for converting microwave signals into corresponding direct current voltages, of the type having a diode, a bypass capacitor, and a resistive termination, the improvement comprising

coplanar transmission line means for forming the resistive termination and for supporting and interconnecting the

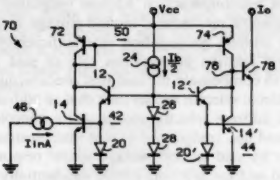
diode and by-pass capacitor, and for receiving the microwave signal from the input port and supplying the microwave signal to the diode.

4,360,866

LINEAR FULL WAVE RECTIFIER AND METHOD FOR PROVIDING FULL WAVE RECTIFIED SIGNALS

William E. Main, Mesa, and Michael McGinn, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1980, Ser. No. 220,328
Int. Cl.³ H02M 7/217
U.S. Cl. 363—127 **7 Claims**



1. A linear full wave rectifier, comprising:

first non-linear full wave rectifier means having an input adapted to receive an alternating input signal applied thereto for producing an output signal at an output thereof that is a non-linear full wave rectified version of the input signal;

second non-linear full wave rectifier means responsive to an input signal supplied to an input thereof for producing a signal at an output thereof that is substantially identical to said output signal produced at said output of said first non-linear full wave rectifier means, said output of said second non-linear full wave rectifier means being coupled to said output of said first non-linear full wave rectifier means; and

feedback means coupled between said output of said first non-linear full wave rectifier means and said input of said second non-linear full wave rectifier means for supplying said input signal thereto thereby constraining said output signal produced from said second non-linear full wave rectifier means such that said input signal is a full wave rectified version of said alternating input signal.

4,360,867

BROADBAND FREQUENCY MULTIPLICATION BY MULTITRANSITION OPERATION OF STEP RECOVERY DIODE

Joseph Gonda, Moultonboro, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

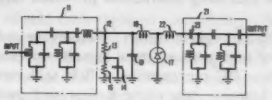
Filed Dec. 8, 1980, Ser. No. 213,935
Int. Cl.³ H03B 19/20; H02M 5/20
U.S. Cl. 363—158 **8 Claims**

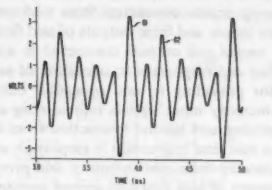
1. A circuit responsive to a periodic, alternating signal of a first frequency from a signal source for generating a second signal at a second frequency being a multiple of the first frequency, the circuit comprising:

first filter means, connected to receive the alternating signal, for passing the alternating signal at said first frequency to an output;

pulse generating circuitry including a step recovery semiconductor diode connected to receive the alternating signal at the output from the first filter means and biasing means, resistively coupled to the diode to present a relatively high impedance thereto, for operating the diode at a level to produce two pulses for each periodic cycle of the alternating signal; and

second filter means, connected to receive the two pulses, for providing resonance at the second frequency to supply the





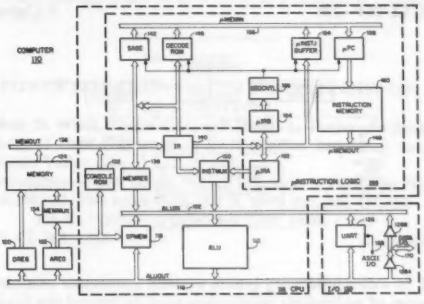
second signal and capable of impedance matching the pulse generating circuitry to a predetermined impedance value.

4,360,868

INSTRUCTION PREFETCH MEANS HAVING FIRST AND SECOND REGISTER FOR STORING AND PROVIDING A CURRENT PC WHILE GENERATING A NEXT PC

Charles T. Retter, Framingham, Mass., assignor to Data General Corporation, Westboro, Mass.

Division of Ser. No. 967,041, Dec. 6, 1978. This application Nov. 5, 1979, Ser. No. 91,022
Int. Cl.³ G06F 9/38
U.S. Cl. 364—200 **3 Claims**



1. A digital computer system including processor means for processing digital data signals; memory means including a plurality of storage locations for storing at least instructions employed by said processor means in controlling said system; processor output bus means connected from an output of said processor means and to an input of said memory means for conducting memory input signals from said processor means to said memory means; and memory output bus means connected from an output of said memory means to an input of said processor means for conducting memory output signals including said instructions from said memory means to said processor means; said processor means including means responsive to certain of said instructions for providing said memory input signals and certain of said memory input signals representing program counts (PCs), each of said PCs representing a corresponding memory means storage location and said memory means responsive to said memory input signals representing said PCs to provide on said memory output bus means corre-

sponding said memory output signals representing said instructions stored in said corresponding storage locations; said processor means including instruction pre-fetch means comprising:

first and second register means for receiving and storing said certain of said memory input signals representing

(1) a current PC representing a first said memory means storage location containing a first said instruction currently being employed by said processor means, and

(2) a next PC representing a second said memory means storage location containing a second said instruction to be next employed by said processor means;

means having inputs connected from said output of said processor means and from outputs of said first and second register means and outputs connected to said processor output bus and responsive to operation of said processor means for providing to said processor output bus said certain memory input signals representing said next PC for requesting said second instruction from said memory means as said first instruction is employed; and,

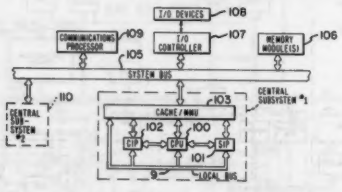
means connected from said output of said processor means and to inputs of said first and second register means and responsive to operation of said processor means for providing new said current and next PC's to said first and second register means after said first instruction has been employed, said new current PC being the previous said next PC.

4,360,869

CONTROL STORE ORGANIZATION FOR A DATA PROCESSING SYSTEM

Philip E. Stanley, Westboro; David E. Cushing, Chelmsford, both of Mass., and Donald R. Taylor, Marina Del Ray, Calif., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 15, 1980, Ser. No. 140,639
Int. Cl.³ G06F *9/26*
U.S. Cl. 364—200 **8 Claims**



1. In a data processing system wherein a processor executes a series of addressable microinstructions to control the functions performed by the system and wherein the execution of a microinstruction by the processor generates the address of the next microinstruction to be executed, a microinstruction storage and transfer device comprising:

an alternate source of microinstruction addresses;

a microinstruction output register;

a microinstruction transfer path coupled to said microinstruction register; and

a microinstruction control store comprising:

first storage means coupled to said microinstruction transfer path for storing microinstructions in a plurality of addressable storage locations, said first storage means having means for selectively addressing and transferring microinstructions stored therein to said microinstruction output register over said microinstruction transfer path responsive to said microinstruction addresses generated by the processor, said first storage means having a first address propagation rate substantially determining the period of time necessary to address and to transfer a microinstruction stored in said first storage means to said microinstruction output register;

address selector means for selecting among said next microinstruction addresses generated by said processor and said microinstruction addresses from said alternate source to output a selected microinstruction address after a first predetermined delay; and

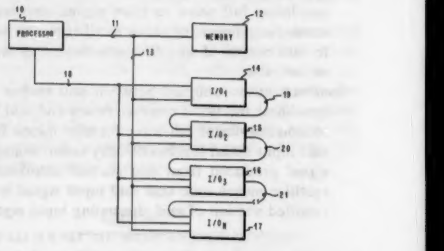
second storage means, coupled to said address selector means and said microinstruction transfer path, for storing microinstructions in a plurality of addressable storage locations, said second storage means having means for selectively addressing and transferring microinstructions stored therein to said microinstruction output register over said microinstruction transfer path responsive to said selected microinstruction address outputted by said address selector means, said second storage means having a second address propagation rate sufficiently faster than said first address propagation rate of said first storage means to compensate for said first predetermined delay of said address selector means such that an address is selected by said address selector means and a microinstruction is addressed and transferred to said microinstruction output register by said second storage means responsive to said selected address in a time period substantially equal to the period of time necessary for said first storage means to address and to transfer a microinstruction stored therein to said microinstruction output register.

4,360,870

PROGRAMMABLE I/O DEVICE IDENTIFICATION

James M. McVey, Leander, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1980, Ser. No. 173,585
Int. Cl.³ G06F *9/06*
U.S. Cl. 364—200 **18 Claims**



1. In a computer system having a CPU connected to I/O devices via a channel for setting addresses into said I/O devices by said CPU, the improvement comprising:

identifying means in each I/O device for identifying itself to said CPU and adapted to be energized by said CPU,

means in said CPU for commanding said I/O devices simultaneously via said channel to prepare for receipt of an identifying address, and

means for selectively energizing least one of said identifying means in least one of said I/O devices and sending an address to that I/O device via said channel.

4,360,871

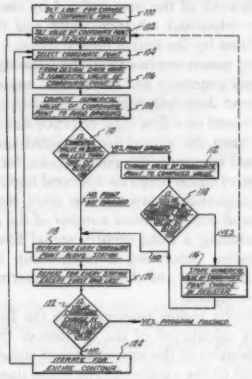
METHOD FOR FABRICATING WIND TURBINE BLADES

David H. Blaney, Tolland, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 972,567, Dec. 22, 1978, abandoned.
This application Sep. 25, 1980, Ser. No. 191,036
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—300 **8 Claims**

1. A method of fabricating a filament wound wind turbine blade comprising the steps of:

defining a surface representative of a winding mandrel;
defining a plurality of stringers along said surface, each of said plurality of stringers being in substantially the same direction as the axis about which said surface is wound;
defining a plurality of stations along said surface, each of said plurality of stations being substantially perpendicular to said plurality of stringers, the intersection of each of said plurality of stringers and stations defining a multiplicity of coordinate points on said surface, said intersections forming a grid of coordinate points; and for each of said coordinate points:
determining the height of said coordinate point from said winding axis;
constructing first and second straight line segments on said surface along said winding path, each said straight line segment connecting said coordinate point respectively with a point on the stringer or station adjacent said coordinate point on opposite sides of said coordinate point;



determining the height of said coordinate point from said winding axis;
constructing a third straight line between said connected points;
determining the presence of a concave portion of said surface by comparing the height of said selected coordinate point from said winding axis with the height of said third straight line from said winding axis, said surface being concave between said connected points along said winding path when the height of said selected coordinate point from said winding axis is less than the height of said third straight line from said winding axis; and
correcting any determined concavities by adjusting the height of said selected coordinate point from said winding axis to be substantially equal to or greater than the height of said third straight line from said winding axis;
providing a form having a surface corresponding to said corrected surface; and
winding filamentary material about said mandrel surface thereby forming said filament wound blade.

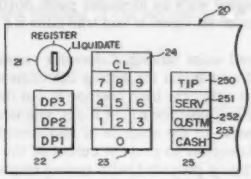
4,360,872

ELECTRONIC CASH REGISTER SYSTEM

Yasuo Suzuki, and Nobuyoshi Sakamoto, both of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 22, 1980, Ser. No. 152,393
Claims priority, application Japan, Jun. 15, 1979, 54-76210
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—405 **7 Claims**

1. An electronic cash register system having a plurality of electronic cash registers which are connected to a common data bus so as to transmit data from one cash register to another and assignable to a plurality of operators given respective operator codes,
at least one of said cash registers comprising a first storage means for storing customer numbers and the data relating to merchandise sold and corresponding to the respective customer numbers for each of the operator codes,
each of said cash registers being a self contained unit, each having its own central processing unit and each of said cash registers further comprising:
(a) mode setting means for setting the cash register into a registration mode or a liquidation mode,
(b) input means for entering data into the cash register,



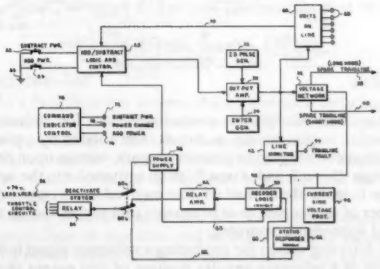
(c) means operative on setting of the cash register to the registration mode and further on entry of an operator code, a customer number and data relating to merchandise sold through said input means to cause said first storage means corresponding to the operator code so entered to store said entered customer number and data relating to merchandise, and
(d) means operative on setting of the cash register to the liquidation mode and further on entry of a particular customer number which has been stored in said first storage means to read out the data relating to merchandise corresponding to said particular customer number from said storage means so as to perform a liquidation transaction.

4,360,873

POWER SELECTION SYSTEM FOR A CONSIST OF LOCOMOTIVES

Calvin D. Wilde, Foster City, and Daniel L. Turner, Belmont, both of Calif., assignors to SAB Harmon Industries, Inc., Grain Valley, Mo.

Continuation-in-part of Ser. No. 18,167, Mar. 7, 1979, Pat. No. 4,234,922. This application Sep. 9, 1980, Ser. No. 185,604
Int. Cl.³ G05D *13/62*; G06G *7/66*; B60L *15/32*
U.S. Cl. 364—426 **23 Claims**



13. Apparatus for controlling the number of on-line locomotives of a consist thereof having a lead locomotive and a plurality of trailing locomotives, where each locomotive has a predetermined, efficient high throttle position and a desired low throttle position, said apparatus comprising:
a plurality of control units including a lead unit for said lead locomotive and at least a first trail unit and a second trail unit

for controlling the throttles of corresponding first and second trailing locomotives,

an electrical control line extending from said lead unit to said trail units in serial order,

said lead unit including operator-activated means for producing either a subtract power command or an add power command to subtract from or add to the number of on-line locomotives of the consist, means for generating a cutout control signal and transmitting the same to said trail units along said control line, and control means for providing said signal with a magnitude that changes in one direction in response to said subtract command and in the opposite direction in response to said add command,

said control signal generating means having circuitry for providing said signal with an identifier pulse portion that indicates that a received signal at said trail units is a valid control signal,

each of said trail units having a decoder responsive to the magnitude of said signal for setting the respective locomotive throttle at either the high position to put the locomotive on line or the low position to cut it out, said decoder having means responsive to the absence of said identifier pulse for disabling the decoder to prevent cutout of the locomotive,

said trail units being provided with means responsive to said signal for changing the magnitude thereof in said one direction by a predetermined amount as said signal is conducted rearwardly in the consist from each trail unit to the next succeeding trail unit, whereby valid control signals cause locomotives to be successively throttled back from the rear of the consist and returned on line from the front.

4,360,874

ELECTRONIC IGNITION CONTROL APPARATUS

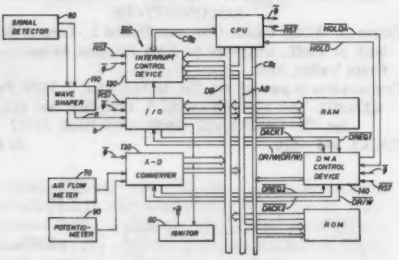
Masahiro Ohba, Toyohashi; Kenzo Ito, Okazaki; Susumu Akiyama, Kariya; Yuuji Hirabayashi, Aichi; Satoshi Hirano, Kariya, and Naoto Ooka, Gamagori, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 21, 1980, Ser. No. 199,234

Claims priority, application Japan, Oct. 22, 1979, 54-136216

Int. Cl.³ F02P *5/04, 3/02;* **G05B** *15/02*

U.S. Cl. 364—431.04 **1 Claim**



1. An electronic ignition control apparatus for an internal combustion engine having an output shaft rotated by a piston, an ignition coil adapted to generate a spark voltage upon deenergization thereof and a spark plug activated by the spark voltage to ignite the air-fuel mixture metered into a combustion chamber of said engine so as to operate said piston, the ignition control apparatus comprising:

first detecting means for producing a reference signal indicative of a reference angular position of said output shaft;

second detecting means for producing a series of electric angular signals respectively at a predetermined angular interval related to the reference signal;

third detecting means for producing a first binary signal indicative of the operating condition of said engine;

a pulse signal generator for producing a series of pulse signals at a predetermined frequency;

first memory means for previously memorizing second and third binary signals respectively indicative of the starting and terminating points for calculation of a time necessary for rotation of a predetermined angle defined by integer times as large as said predetermined angular interval, said first memory means further memorizing a program for calculating an optimum spark advance angle of said engine based on a function describing a desired relationship among the operating condition of said engine, a rotational time of said output shaft and the spark advance angle, for determining a fourth binary signal indicative of an angular position defined by integer times as large as said predetermined angular interval at the advance angle side of the calculated advance angle, and for calculating a time defined by the difference between the calculated advance angle and the angular position defined by said fourth binary signal;

second memory means for temporarily storing the second and third binary signals from said first memory means and storing the fourth binary signal and a fifth binary signal indicative of the time defined by the difference between the calculated advance angle and the angular position defined by the fourth binary signal;

control means responsive to the pulse signals from said pulse signal generator and the electric angular signals from said second detecting means for producing a first control signal based on a first logic equation describing a relationship between the second binary signal and the first predetermined number of the pulse signals, for producing a second control signal based on a second logic equation describing a relationship between the third binary signal and the second predetermined number of the pulse signals and for producing a third control signal based on a third logic equation describing a relationship between the fourth binary signal and the third predetermined number of the pulse signals;

calculation means responsive to the first control signal to start calculation of the number of the pulse signals and responsive to the second control signal to cease the calculation of the number of the pulse signals, said calculation means producing a sixth binary signal indicative of the calculated number of the pulse signals defining the actual rotation time of said output shaft;

processing means for calculating the optimum spark advance angle from the function in dependence upon the first and sixth binary signals such that the fourth binary signal is determined in relation to the calculated spark advance angle to be stored in said second memory means, said processing means further determining an energization timing of said ignition coil in relation to the calculated advance angle and calculating the difference between the calculated spark advance angle and the angular position defined by the fourth binary signal such that the fifth binary signal is determined in relation to the calculated difference to be stored in said second memory means; and

drive means responsive to the determined energization timing from said processing means to energize said ignition coil and responsive to the third control signal from said control means to start calculation of the value of the fifth binary signal from said second memory means to conduct deenergization of said ignition coil upon completing the calculation.

4,360,875

AUTOMATED, DOOR-TO-DOOR, DEMAND-RESPONSIVE PUBLIC TRANSPORTATION SYSTEM

Robert W. Behnke, 2010 Wembley Park Rd., Lake Oswego, Oreg. 97034

Filed Feb. 23, 1981, Ser. No. 236,858

Int. Cl.³ G06F *15/48*

U.S. Cl. 364—436 **33 Claims**

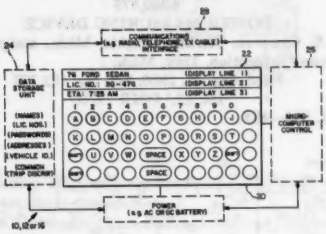
1. An automatic system for providing public ride-user access

to transportation by driver-operated vehicles, each vehicle having independent variable origins and destinations and routes therebetween determined by its driver, said system comprising:

(a) a central coordinating station comprising means for receiving ride-offer electromagnetic signals, indicative of driver-selected origins and destinations, and ride-request electromagnetic signals, indicative of ride-user-selected origins and destinations, respectively;

(b) respective driver terminal means in telecommunication with said central coordinating station, each of said driver terminal means including driver register means for registering a driver-selected origin and variable driver-selected destinations from a plurality of possible destinations having no predetermined route relationship to one another and means for transmitting to said station said ride-offer electromagnetic signals;

(c) respective ride-user terminal means in telecommunication with said central coordinating station, each of said ride-user terminal means including ride-user register means for registering a ride-user-selected origin and destination not necessarily located identically to said driver-selected origin and destination and means for transmitting to said station said ride-request electromagnetic signals;



(d) said central coordinating station including logical circuitry means automatically responsive to said ride-offer and ride-request electromagnetic signals respectively for comparing said respective electromagnetic signals with each other and matching together a respective driver and ride-user whose respective origins and destinations as indicated by said signals bear a predetermined geographical relationship to each other even though such respective origins and destinations are not located identically to each other;

(e) said central coordinating station further including means automatically responsive to said respective electromagnetic signals for transmitting electromagnetic message signals to a respective driver directing said respective driver to the respective origin of a ride-user with which said respective driver has been so matched, each of said driver terminal means having receiver means in telecommunication with said central coordinating station for receiving said electromagnetic message signals.

4,360,876

CARTOGRAPHIC INDICATOR SYSTEM

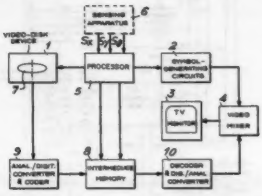
Herve Girault; Jean C. Reymond, and Pierre Cauzan, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 2, 1980, Ser. No. 164,533
Claims priority, application France, Jul. 6, 1979, 79 17601
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—449 **4 Claims**

1. A cartographic indicator system aboard an aircraft, comprising:

data-storing means including a video disk, carrying prerecorded information reproducible on a screen of a cathode-ray tube as an image of a map of territory overflown by the aircraft, and reading means for extracting the information carried on selected portions of said disk, the information in said portions relating to image points of respective rectangular zones of a map to be visualized, said zones all having the same width and height, said map being subdivided into a plurality of bands extending in a first reference direction Y and adjoining one another in a second reference direction X orthogonal to said direction Y, each of said bands having a width equal to that of said zones in said direction X and containing a multiplicity of said zones adjoining one another in said direction Y, one of said reference directions corresponding to geographic longitude, the other of said reference directions corresponding to geographic latitude;

sensing means for supplying coordinate signals S_X, S_Y representing geographical position and a rotational signal S_θ representing heading of the aircraft at any instant;



an intermediate memory with cells arranged in a multiplicity of rows of a matrix, said multiplicity exceeding the number of cells necessary for storing the data relating to all the image points of a zone, the number of rows and the number of cells per row being at least equal to the number of image points lying in the diagonal of a zone to facilitate a visual representation of the map image in any angular orientation upon sequential readout of said cells;

monitoring means including a cathode-ray tube connected to said intermediate memory; and

processing means responsive to said sensing means for controlling the loading of said cells with data extracted from selected portions of said disk in a manner enabling a display of a map image on the screen of said cathode-ray tube, upon sequential readout of said cells, with variable angular orientation determined by said rotational signal S_θ.

4,360,877

DISTRIBUTED DATA PROCESSING SYSTEM AND METHOD FOR A FLUID DISPENSER

Earl M. Langston, Fort Wayne; Charles W. Moore, Hudson; Richard L. Malecki, and Roger C. Bruot, both of Fort Wayne, all of Ind., assignors to Tokheim Corporation, Fort Wayne, Ind.

Filed Apr. 8, 1980, Ser. No. 138,357
Int. Cl.³ G06F *15/56*
U.S. Cl. 364—465 **5 Claims**

1. In a fuel dispenser system, the combination including

a plurality of fuel dispensers, each of which is operable independently of the other fuel dispensers,

a digital readout means on each dispenser for displaying information relating to dispensed gallonage and the cost thereof,

a plurality of remote terminals, one for each fuel dispenser, controlling its operation and its digital readout means,

a first power supply means operatively connected to each of said remote terminals,

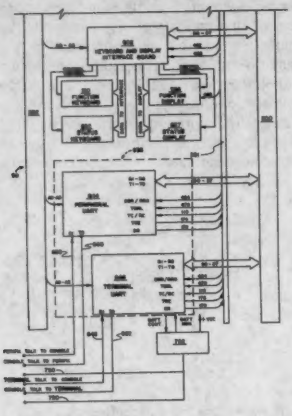
a CPU-console receiving and transmitting digital signals which address and control each of said remote terminals,

a second power supply means for enabling said CPU-console,

each remote terminal being operative in response to digital signals from its fuel dispenser as well as from said CPU-console,

wherein the improvement comprises:

said plurality of remote terminals being located adjacent said CPU-console and remote from said fuel dispensers whereby replacement of said CPU-console and each of said remote terminals may be accomplished without dismantling any of the fuel dispensers, and



each remote terminal having a microcomputer capable of independent processing of dispensed gallonage and cost information of its respective dispenser whereby each remote terminal may operate even when the CPU-console is inoperative.

4,360,878

METHOD FOR THE LIBRARY STORAGE OF A WORKPIECE PROGRAM FOR NUMERICALLY CONTROLLED MACHINE TOOLS

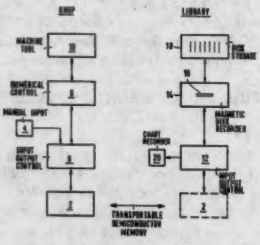
Siegfried Waller, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 943,302, Sep. 18, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 163,961

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742124

Int. Cl.³ G05B *19/42*

U.S. Cl. 364—474 **3 Claims**



1. A method for recording and storing workpiece programs for use with a numerically controlled machine tool having a manual input keyboard comprising:

(a) providing the machine tool control with a working memory in the form of a transportable semiconductor memory capable of storing a complete workpiece program, the working memory adapted to be plugged into and unplugged from the numerically controlled machine tool;

(b) each time that a new workpiece is to be prepared by the numerically controlled machine tool, programming the associated machining steps by means of the manual input keyboard and storing the workpiece program so generated in the working memory:

(c) unplugging the working memory;

(d) moving the working memory to a library storage room separate from the room in which the machine tool is located;

(e) plugging the working memory into the input/output control of a recording/playback instrument; and

(f) recording the contents of the working memory onto an external data carrier.

4,360,879

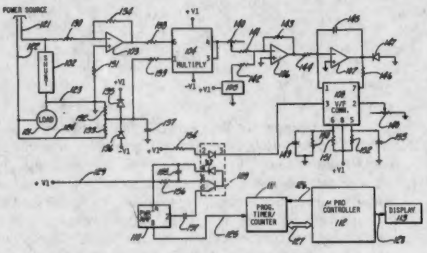
POWER MEASURING DEVICE

Larry E. Cameron, Sterling Heights, Mich., assignor to The Valeron Corporation, Troy, Mich.

Filed Aug. 28, 1980, Ser. No. 182,227

Int. Cl.³ G01R *19/00*

U.S. Cl. 364—483 **6 Claims**



1. Apparatus for determining average power consumption by an electrical load comprising:

means resistively coupled to the load operative to generate first and second electrical signals respectively proportional to the voltage across and the current through the load;

multiplier means coupled to the means to generate the first and second signals, operative to generate at a multiplier means output a third signal proportional to the product of the first and second signals;

a reference offsset signal source and signal summing means coupled to the reference offset signal source and to the multiplier means output for combining a reference offset signal with the third signal, the reference offset signal having a magnitude and polarity such that the combined reference offset signal and third signal will have a constant polarity regardless of the polarity of the third signal;

converter means coupled to the signal summing means operative to generate a pulse train signal having a frequency proportional to the amplitude of the combined reference offset signal and third signal; and

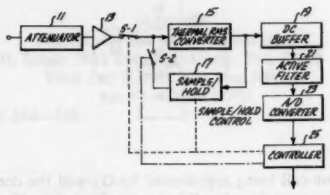
utilization means including counter means having a counting input coupled for receipt of the pulse train signal, and microcomputer means coupled to the counter means, operative to periodically read contents of the counter means at predetermined time intervals and to convert the read contents into an average power consumption indicating signal that is a function of the frequency of the pulse train signal.

4,360,880

RECIRCULATING RMS AC CONVERSION METHOD AND APPARATUS WITH FAST MODE

Benjamin T. Brodie, and Henriecus Koeman, both of Edmonds, Wash., assignors to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Continuation-in-part of Ser. No. 62,923, Aug. 2, 1979, Pat. No. 4,274,143. This application Jan. 26, 1981, Ser. No. 228,081
Int. Cl.³ G01R 15/10
U.S. Cl. 364—483 15 Claims



7. Apparatus for accurately determining the RMS value of an unknown signal comprising:

(a) RMS conversion means having a relatively smooth transfer curve for converting an input signal into a DC signal proportional to the RMS value of the input signal;

(b) recirculating means connected to the output of said conversion means for recirculating the output of said conversion means back to the input of said conversion means;

(c) controllable switch means connected to said RMS conversion means and said recirculating means for selectively applying either an unknown signal or the output of said recirculating means to the input of said RMS conversion means; and,

(d) control and combining means connected to said RMS conversion means and said controllable switch means for:

(i) causing said controllable switch means to apply an unknown signal to said RMS conversion means and receiving the output of said RMS conversion means, said output forming a first converter signal;

(ii) causing said controllable switch means to apply the output of said recirculating means to the input of said RMS conversion means and receiving the output of said RMS conversion means, said output forming a second converter signal;

(iii) combining said first and second converter signals in accordance with the relationship to $2Y_1 - Y_2$ to obtain a corrected signal, X, that accurately represents the RMS value of the unknown signal, where Y_1 is directly related to said first converter signal and Y_2 is directly related to said second converter signal;

(iv) combining said first converter signal with said corrected signal in accordance with the relationship $Y_1 - X$ to obtain an error signal;

(v) causing said controllable switch means to again apply said unknown signal to the input of said RMS conversion means and receiving the output of said RMS conversion means, said output forming a third converter signal; and,

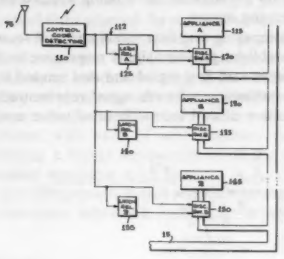
(vi) subtracting said error signal from said third converter signal to obtain a corrected signal that accurately represents the RMS value of the reapplied unknown signal.

4,360,881

ENERGY CONSUMPTION CONTROL SYSTEM AND METHOD

John R. Martinson, 634 Stone Canyon, Los Angeles, Calif. 90024

Filed Jul. 7, 1980, Ser. No. 165,853
Int. Cl.³ H04B 7/00
U.S. Cl. 364—493 5 Claims



1. An electrical energy consumption control system for controlling the input of electrical energy to a plurality of electrical energy consuming appliances comprising for each appliance power circuit:

(a) control generating means for selectively generating at least two distinguishable control codes;

(b) a time-controlled computer for automatically controlling the generation of said control codes by said control generating means;

(c) modulation means for impressing said control codes on sub-carrier of broadcast station;

(d) receiving means mountable "in-line" with an energy consuming appliance for receiving said sub-carrier, said receiving means comprising further:

(1) means for detecting the reception of said control codes;

(2) electrical power disconnecting switch means connected to said detecting means for disconnecting said appliance from its source of electrical energy supply upon detection by said detecting means of one of said control codes; and

(3) latching means for maintaining the energy consumption device disconnected from its source of energy supply for a predetermined period until another control code is detected by said detecting means.

4,360,882

PROCESS CONTROL SYSTEM

William S. Stewart, and Gary L. Funk, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 27, 1980, Ser. No. 181,912
Int. Cl.³ G05B 15/00; F01D 17/02
U.S. Cl. 364—494 13 Claims

1. Apparatus comprising:

compressor means;

an expander means;

a secondary driving means;

a shaft connecting said expander means, said secondary driving means and said compressor means;

means for supplying a gas to the suction inlet of said compressor means;

means for supplying compressed gas from the discharge outlet of said compressor means;

means for supplying a driving force to said secondary driving means;

means for supplying a process gas to said expander means;

means for bypassing at least a part of said process gas around said expander means;

first control valve means for manipulating the flow of said process gas to said expander means;

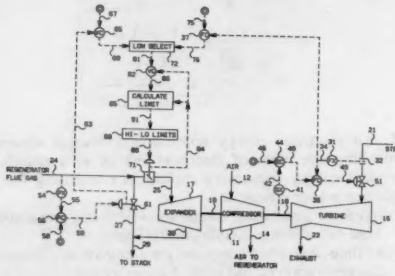
second control valve means for manipulating the bypassing of at least a part of said process gas around said expander means;

means for establishing a first signal representative of the actual driving force being applied to said secondary driving means;

means for establishing a second signal representative of a low limit on the driving force being applied to said secondary driving means;

means for comparing said first signal and said second signal and for establishing a third signal responsive to the difference between said first signal and said second signal;

means for establishing a fourth signal representative of the actual position of said second control valve means;



means for establishing a fifth signal representative of a low limit on the position of said second control valve means;

means for comparing said fourth signal and said fifth signal and for establishing a sixth signal responsive to the difference between said fourth signal and said fifth signal;

means for comparing said third signal and said sixth signal and for establishing a seventh signal representative of the lower one of said third and sixth signals;

means for establishing an eighth signal representative of the actual position of said first control valve means;

means for comparing said seventh signal and said eighth signal and for establishing a ninth signal responsive to the difference between said seventh signal and said eighth signal; and

means for manipulating said first control valve means in response to said ninth signal.

4,360,883

METHOD OF RESTORING A PICTURE CELL BY ESTIMATION WITH HIGH DENSITY

Koichi Ejiri, Chiba; Morisumi Kurose, Yokohama, and Seiji Hayakawa, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 20,055, Mar. 13, 1979, abandoned. This application Aug. 6, 1980, Ser. No. 175,697

Claims priority, application Japan, Mar. 22, 1978, 53-32767

Int. Cl.³ H04N *5/14, 1/40*

U.S. Cl. 364—515 **2 Claims**

1. A method of restoring a picture cell by estimation which comprises the steps of:

sampling a picture to obtain a plurality of equal size square picture cells as samples;

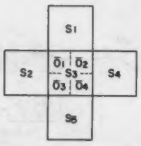
selecting a picture cell to be restored;

determining the optical density (S_3) of said picture cell to be restored;

determining the optical densities of four picture cells which are adjacently positioned above, below, at the left side, and at the right side of the picture cell to be restored, said optical densities being represented by the values S_1, S_5, S_2 and S_4 respectively;

dividing said picture cell to be restored into four equal sized square sub-cells, said four sub-cells being identified as upper left, upper right, lower left, and lower right;

determining estimated optical densities O_1, O_2, O_3 and O_4 for said four sub-cells from mutual relationships between the optical density (S_3) of said picture cell to be restored and the optical densities (S_1, S_5, S_2 and S_4) of said four picture cells adjacently positioned about said picture cell to be restored, the optical density of said upper left sub-cell being represented by O_1, the density of said upper right sub-cell being represented by O_2, the density of said lower



left sub-cell being represented by O_3, and the density of said lower right sub-cell being represented by O_4;

outputting by means of a decoder a first control signal to generate a black picture cell when the value of each of said estimated optical densities is 1;

outputting by means of said decoder a second control signal to generate a white picture cell when the value of each of said estimated optical densities is 0; and

outputting by means of said decoder a third control signal to generate at least one black sub-cell which has an estimated optical density of 1 and to generate white sub-cells for the remainder of said sub-cells which remainder of said sub-cells have an estimated optical density of 0.

4,360,884

FIGURE DISPLAYING DEVICE

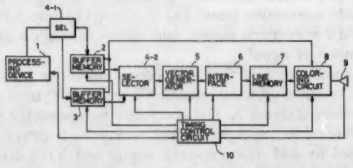
Kunihiro Okada; Takeyuki Endo; Shigeru Yabuuchi, all of Hinode; Takakazu Huno, Tachikawa; Kazuyuki Kodama, Kokubunji, and Yasutaka Shibuya, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 20, 1980, Ser. No. 161,407

Claims priority, application Japan, Jun. 29, 1979, 54-81346

Int. Cl.³ G06F *15/20, 3/153*

U.S. Cl. 364—521 **4 Claims**



1. A device for displaying plural fundamental figures comprising: first means for generating the start and end point coordinate data and the gradient data of the respective vectors of fundamental figures which are formed by a preset number of vectors; first memory means for storing the start and end point coordinate data; second memory means for storing the gradient data; display means for displaying the fundamental figures in a raster scan of horizontal lines; arithmetic operation means, operative during the scanning operation of a first horizontal scanning line on said display means prior to the scanning operation of a second horizontal scanning line thereon, for examining whether or not the vectors forming each fundamental

figure are located on said second scanning line on the bases of the data from said first memory means and for feeding out the start point coordinate data and adding the gradient data from said second memory means to the start point coordinate data from said first memory means, when the vector is located on said second scanning line, thereby to renew the start point coordinate data of said first memory means in accordance with the sum of the gradient data and the start point coordinate data; third memory means having the capacity corresponding to the number of picture elements in said second horizontal scanning line and being operative to store preset data in an address corresponding to the start point coordinate data provided by said arithmetic operation means; and control means for displaying, during the scanning operation of the second horizontal scanning line, the data from said third memory means on said display means.

4,360,885

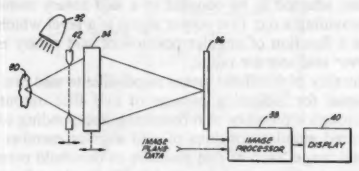
MICRO-OPTICAL TOMOGRAPHY

Albert D. Edgar, 3912 Eton La., Austin, Tex. 78759

Filed Jan. 2, 1980, Ser. No. 109,092

Int. Cl.³ G02B *27/00*

U.S. Cl. 364—525 **5 Claims**



1. Apparatus for viewing a selected specimen to construct a micro-optical tomograph, comprising:

(a) optical means to form an image of the specimen so that a first level of the specimen is in focus and a second level of the specimen located behind said first level is not in focus;

(b) means to suppress said not-in-focus second level to form a dissected in-focus first two-dimensional image array;

(c) means to hold an output image;

(d) means to transfer said dissected in-focus first two-dimensional image array to said output image;

(e) means to vary the focus of said optical means so said first level is not in focus and said second level is in focus;

(f) means utilizing said dissected in-focus first two dimensional image array to extract said not-in-focus first level from the optical imaging of step (e) to form a dissected in-focus second two-dimensional image array; and

(g) means to transfer said dissected in-focus second two-dimensional image array to said output image to form a composite image array.

4,360,886

METHOD AND APPARATUS FOR ANALYZING THE FEASIBILITY OF PERFORMING A PROGRAMMED SEQUENCE OF MOTIONS WITH A ROBOT

Evans Kostas, Bay Village; Gerald W. Crum, Elyria, and Jerome F. Walker, Shaker Heights, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 137,234, Apr. 4, 1980, Pat. No. 4,305,028. This application Oct. 27, 1980, Ser. No. 201,221

Int. Cl.³ G05B *19/42*; B25J *9/00*; G06F *11/30*

U.S. Cl. 364—551 **14 Claims**

1. Automation feasibility analyzing apparatus for analyzing the feasibility of performing a sequence of motions with a work robot, comprising:

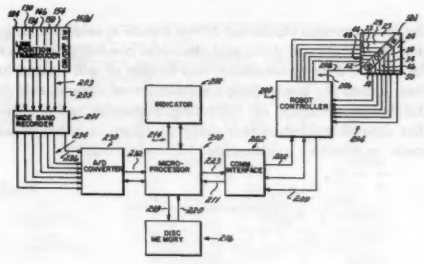
a work robot at a first location having a plurality of power-driven, signal-controlled links interconnected to permit relative motion therebetween to define plural degrees of freedom, at least some of said links being relatively massive, said work robot having a given mechanical response characteristic for positioning said links in response to position signals input to each link at a rate of N signals per link per second;

a plurality of work robot link position transducers, a different work robot link position transducer being associated with each of said work robot links for generating an actual position signal representative of the actual position of the associated work robot link;

a portable, relatively lightweight, manually manipulable simulator robot at a second location remote from said first location, said simulator robot having a plurality of interconnected links adapted the manual movement in different degrees of freedom for setting a program of desired mechanical responses, said links and degrees of freedom of said simulator robot simulating those of said work robot;

a plurality of simulator robot link position transducers, a different simulator robot link position transducer being associated with each of said simulator robot links for generating a signal representative of the position of its associated simulator robot link;

signal recording means at said second location responsive to said simulator robot link position transducers for storing



the signals generated thereby representative of a program of desired mechanical responses;

work robot control means at said first location responsive to said stored position signals generated by said plurality of simulator robot link position transducers for manipulating the work robot links for performing movements corresponding to the program of desired mechanical responses limited only by said given mechanical response characteristic of said work robot;

analyzer means responsive to (a) said actual position signals generated by said plurality of work robot link position transducers when said work robot control means is input with stored position signals and (b) said stored position signals generated by said simulator robot transducers, for generating error signals correlated to the extent to which said work robot is capable of performing the program of desired mechanical responses manually imparted to said simulator robot; and

indicating means responsive to said error signals for providing a humanly perceptible indication of the feasibility of said work robot for performing the program of desired mechanical responses imparted to said simulator robot.

4,360,887

SKIN CATEGORIZING APPARATUS

Raymond L. Wilson, Liverpool, England, and James A. Dingwall, Edinburgh, Scotland, assignors to Edward Wilson & Son Limited, England

Filed Jul. 31, 1980, Ser. No. 173,922

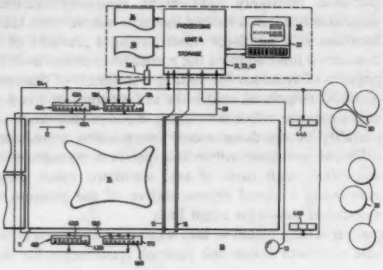
Claims priority, application United Kingdom, Aug. 4, 1979, 7927246

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—552 **12 Claims**

1. Skin categorizing apparatus comprising, at a first location,

a bed support on which skins laid out flat are to be categorized, scanning means for generating data signals concerning area of a skin, means for displaying categorizing data concerning area, thickness and quality, and data entry means at least for skin quality; means for transmitting data between the first location and a second location remote from the first location, the means for transmitting including electrical conductor connection of



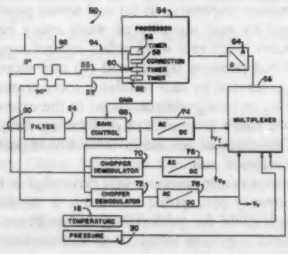
the locations and electronic driver means at said second location to activate and drive said electrical conductor connection for all said data transmission; and further at said second location, means for controlling transmission of data signals from the first location, and for collecting, displaying and processing that data to individual skin category form, in either of automatic or selective modes under supervisor control.

4,360,888

OMNIDIRECTIONAL AIRSPEED SYSTEM

Peter J. Onksen, Merrimack, N.H.; Robert G. Hundley, deceased, late of Burlington, Mass., and Francine Hundley, heiress, Duxbury, Mass., assignors to Pacer Systems, Inc., Burlington, Mass.

Filed May 15, 1980, Ser. No. 150,118
Int. Cl.³ G01C *21/10*; G06F *15/20*
U.S. Cl. 364—565 **20 Claims**



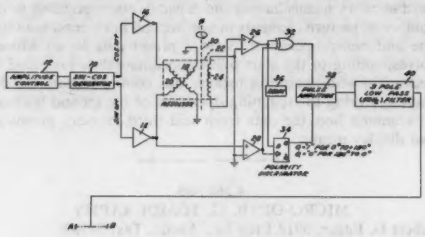
1. An omnidirectional air speed system comprising a mast, a shaft mounted for rotation within the mast, an arm connected to the shaft and extending radially therefrom for rotating with the shaft, means for rotating the shaft, pressure samplers on opposite ends of the shaft, a pressure differential sensor connected to the pressure samplers for producing a signal related to differential pressure, a disc mounted on the shaft having at least one irregularity and irregularity sensing means mounted adjacent the disc for sensing the irregularity, means connected to the irregularity sensing means and to the pressure differential sensor for producing indications of speed vectors and sums.

4,360,889

ROTARY POSITION INDICATING CIRCUIT

Rudolph J. Liedtke, Detroit, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed Jul. 2, 1980, Ser. No. 165,272
Int. Cl.³ G06G *7/22*; G01B *7/30*; H03D *13/00*
U.S. Cl. 364—559 **6 Claims**



1. Apparatus for indicating angular position of a rotary member over a selected angular range comprising

means adapted to be coupled to a said rotary member for providing a d.c. first output signal at a level which varies as a function of angular position of said rotary member over said angular range,

a plurality of threshold means responsive to said first output signal for indicating passage of said first output signal through a plurality of thresholds corresponding to preselected angular positions of said angular member within said range, each of said plurality of threshold means providing a d.c. second output signal indicative of passage of said first output signal through a corresponding said threshold,

priority means for assigning a selected order of priority among said second output signals corresponding to a selected order of preselected angular positions within said range from a nominal zero position, and

means operatively coupled to said threshold means and to said priority means and responsive to said second output signals for indicating a one of said output signals of highest priority corresponding to a one of said preselected angular positions farthest from said nominal zero reached by said rotary member.

4,360,890

APPARATUS FOR SIGNALLING SYSTEM

Robert J. Fahey, Framingham, and Robert A. Norbedo, North Andover, both of Mass., assignors to GTE Products Corp., Stamford, Conn. and GTE Laboratories Inc., Waltham, Mass.

Filed Nov. 14, 1979, Ser. No. 94,244
Int. Cl.³ G06F *9/00, 7/00*
U.S. Cl. 364—900 **16 Claims**

1. In a signalling system, apparatus comprising:

a plurality of remote control means each comprising:

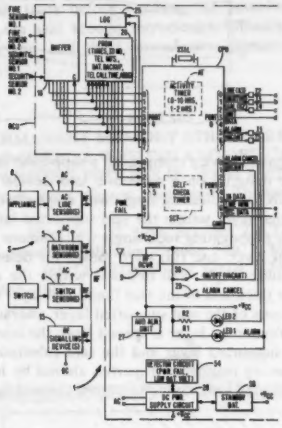
self-check timing means operative to store self-check timing data therein, said self-check timing data representing a predetermined period of time the expiration of which corresponds to a predetermined time of day, said self-check timing data having a value whereby the expiration of the predetermined period of time corresponds to a time of day differing from the expiration times of day of at least some of the other remote control means;

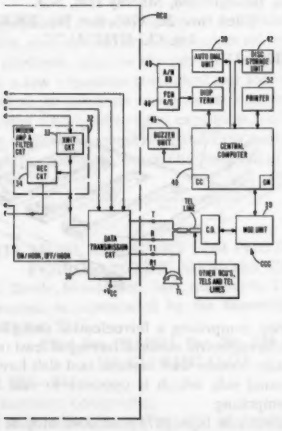
clocking operative to alter the self-check timing data stored in the self-check timing means so as to have a predetermined value at the expiration of the predetermined period of time; and

self-check message generating means operative at or after the self-check data in the self-check timing means having the predetermined value to initiate a self-check

operation and to produce a self-check message indicative of the self-check operation; and

processing means arranged to receive and process messages produced by the plurality of remote control means, said processing means being operative in response to each message from a remote control means to derive self-check timing data for use by the remote control means in the next self-check operation, said self-check timing data representing a period of time and having a value whereby the expiration of the period of time corresponds to the





same time of day at or following which the last self-check operation was initiated by the remote control means, said processing means being operative to produce a message containing the self-check timing data; and

said remote control means further including means operative to receive the message produced by the processing means and in response thereto to cause the self-check timing data in the message to be applied to and stored in the self-check timing means for use thereby in initiating the next self-check operation.

4,360,891

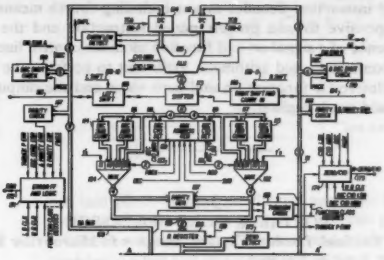
ADDRESS AND DATA INTERFACE UNIT

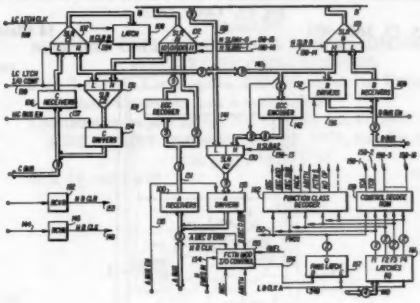
Michael H. Branigin, Penllyn; Ladislaw D. Cubranich, Lansdale, and Edward E. Henderson, Philadelphia, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,267

Int. Cl.³ G06F *9/30*

U.S. Cl. 364—900 **8 Claims**





1. An integrated circuit chip adapted for connection to external means including an instruction bus on which instructions appear, a source producing a clock pulse, a function modifier control line on which function modifier signals appear, and at least one data bus, said integrated circuit chip including thereon:

instruction decoder means for receiving an instruction from said instruction bus, a clock pulse from said source, and a signal on said function modifier control line, said instruction decoder means being responsive to the leading edge of said clock pulse for producing control signals during said signal pulse;

a result register having an output;

an arithmetic logic unit having an output connected to said result register for performing an Exclusive-Or function on signals applied thereto;

means for connecting the output of said result register to a first input of said arithmetic logic unit;

error syndrome decoder means connected between said data bus and a second input of said arithmetic logic unit;

said instruction decoder means including first means responsive to a predetermined instruction on said instruction bus and the presence of a signal on said function modifier control line for controlling said error syndrome decoder means to decode an error syndrome on said data bus;

said instruction decoder means including second means responsive to said predetermined instruction on said instruction bus and the presence of a signal on said function modifier control line for controlling said arithmetic logic unit to take the Exclusive-Or of said decoded error syndrome and the output from said result register;

said result register being responsive to the trailing edge of

said clock pulse for receiving the output of said arithmetic logic unit;

said instruction decoder means includes third means responsive to said predetermined instruction and the absence of a signal on said function modifier control line for inhibiting operation of said error syndrome decoder means whereby said error syndrome decoder means produces a zero value output; and

said instruction decoder means including fourth means responsive to said predetermined instruction and the absence of a signal on said function modifier control line for controlling said arithmetic logic unit to perform the Exclusive-Or function on said zero value and the output of said result register.

4,360,892

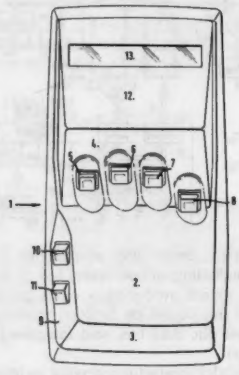
PORTABLE WORD-PROCESSOR

Cyril Endfield, London, England, assignor to Microwriter Limited, London, England

Continuation-in-part of Ser. No. 13,824, Feb. 22, 1979, abandoned. This application Sep. 18, 1980, Ser. No. 188,571

Int. Cl.³ G06F *3/023*

U.S. Cl. 364—900 **14 Claims**



1. A single hand portable word-processor comprising:

(i) a microprocessor; to enable said word-processor to be connected to a printer;

(v) memory means connected to said microprocessor;

(vi) an internal power supply connected to supply power to all the aforesaid components; the microprocessor being programmed to respond to signals produced by operation of a combination of up to a maximum of five keys to generate a coded signal representing a particular alphanumeric character or processing instruction and to process the character signals in response to the instruction signals, to feed signals to the display device for display of processed characters as an edited text, and to the memory means to store the edited text and print format instruction signals available for transmission through the output means;

(vii) each one of said four finger keys being positioned so as to be preferentially operated by a respective one of the fingers of an operator's hand and the thumb keys being conveniently positioned to be operated by the operator's thumb, and

(viii) a main body generally in the form of a truncated rectangular pyramid having a front face carrying said four finger keys and a side face carrying said two thumb keys.

4,360,893

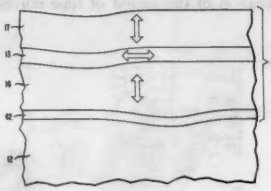
MAGNETIC DEVICES AND METHOD OF MANUFACTURE

Andrew H. Bobeck, Chatham, and James C. North, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 26, 1980, Ser. No. 163,338

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—36 **10 Claims**



1. Magnetic device comprising a supported layer of domain magnetic material on a substrate, said device comprising (i) first means for nucleating single wall magnetic domains within a functional layer within the said supported layer, (ii) second means for propagating such single wall domains within the said functional layer, and (iii) third means for detecting the presence of such single wall domains within the said functional layer, the thickness of the said functional layer being less than the thickness of the said supported layer, characterized in that the said functional layer is spaced from the interface between the said supported layer and the said substrate by a layered region having magnetic properties altered by implantation of ions, implanted ions having traversed the said functional layer.

4,360,894

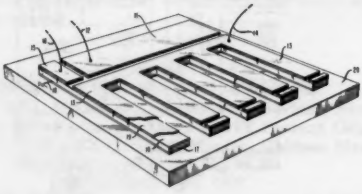
MULTI-TRACK FERROELECTRIC DEVICE

John M. Geary, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1980, Ser. No. 208,835

Int. Cl.³ G11C *11/22*

U.S. Cl. 365—117 **9 Claims**



1. Device comprising a ferroelectric slab (10) of a planar-wall type ferroelectric material having at least one direction of ferroelectric domain wall motion, said slab having a first side and a second side which is opposite to said first side, said device comprising

a first electrode layer (17) positioned atop at least a portion of said first side of said ferroelectric slab,

a second electrode layer (13) positioned atop a first portion of said second side of said ferroelectric slab, and

a third electrode layer (11) positioned atop a second portion of said second side of said ferroelectric slab,

at least a portion of said ferroelectric slab between said first electrode and said second electrode being divided by gaps into a plurality of ferroelectric domain wall motion tracks, said plurality comprising at least

a ferroelectric domain wall motion track which is here designated as the first ferroelectric domain wall motion track,

a ferroelectric domain wall motion track which is adjacent

to said first ferroelectric domain wall motion track and which is here designated as the second ferroelectric domain wall motion track, and

a ferroelectric domain wall motion track which is adjacent to said second ferroelectric domain wall motion track and which is here designated as the third ferroelectric domain wall motion track;

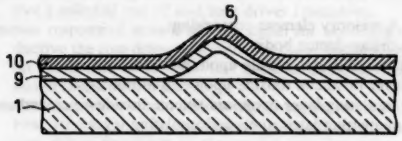
said domain wall motion tracks being disposed such that movement of a ferroelectric domain wall unidirectionally in said direction of ferroelectric domain wall motion results in said ferroelectric domain wall reaching the boundary of the gap between said first ferroelectric domain wall motion track and said second ferroelectric domain wall motion track before reaching the boundary of the gap between said second ferroelectric domain wall motion track and said third ferroelectric domain wall motion track.

4,360,895

PERMANENT MEMORY STRUCTURE WITH THERMO-OPTICAL WRITING AND OPTICAL READING AND WRITING PROCESS IN SUCH A STRUCTURE

Jean Cornet, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 27, 1981, Ser. No. 228,722
Claims priority, application France, Feb. 1, 1980, 80 02246
Int. Cl.³ G11C *13/04*; G11B *7/24*
U.S. Cl. 365—127 **7 Claims**



1. A permanent memory structure with thermal writing or inscription and optical reading, supported by a forwardly moving substrate, wherein the substrate is made from a material with a low expansion coefficient and the inscribable layer deposited on the substrate comprises at least one double metal layer having a high differential expansion coefficient between the very expansible material of the first metal layer and the only slightly expansible, but ductile material of the other metal layer.

4,360,896

WRITE MODE CIRCUITRY FOR PHOTOVOLTAIC FERROELECTRIC MEMORY CELL

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 30, 1981, Ser. No. 230,177
Int. Cl.³ G11C *11/22*
U.S. Cl. 365—145 **10 Claims**

1. A memory, comprising,

solid state switch means capable of assuming one of two states dependent on a bias signal which is to be applied thereto,

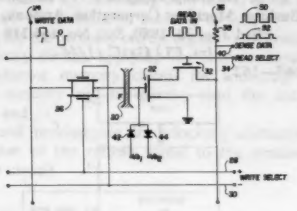
photovoltaic-ferroelectric means for storing information regarding said bias signal, which information is stored in the form of a remanent polarization in one of two possible directions,

means for writing said information into said photovoltaic-ferroelectric means,

illumination means for illuminating said photovoltaic-ferroelectric means when it is desired to generate said bias signal,

means for applying said generated bias signal to said solid state switch means, and

variable impedance means connected to said photovoltaic-ferroelectric means and said switch means for assuming a relatively low impedance when said information is written



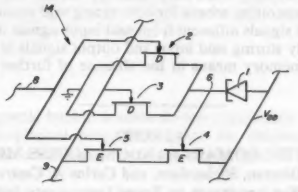
into said photovoltaic-ferroelectric means so that a relatively large write voltage appears across said photovoltaic-ferroelectric means and for assuming a relatively high impedance when said bias signal is generated, to allow said bias signal to be effectively applied to said switch means.

4,360,897

MEMORY CELL COMPRISING TUNNEL DIODES AND FIELD EFFECT TRANSISTORS

Kurt Lehovec, Los Angeles, Calif., assignor to University of Southern California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 928,543, Jul. 27, 1979, Pat. No. 4,242,595. This application Nov. 15, 1979, Ser. No. 94,571
Int. Cl.³ G11C *11/38*
U.S. Cl. 365—159 **10 Claims**



1. An array of static memory cells, each cell comprising a tunnel diode inserted between a supply voltage and a first circuit, said supply voltage not much larger than the voltage drop across said tunnel diode pertaining to valley current flow so that the current through said tunnel diode when operating outside the tunnel regime never exceeds significantly the valley current, a variety of currents through said first circuit in response to sets of voltage signals applied at said first circuit through two circuit lines commonly referred to as word and bit lines, a first set of said signals such that the corresponding current withdrawn through said first circuit from the node between said tunnel diode and said first circuit is larger than the peak current of said tunnel diode, a second set of said signals such that the corresponding current through said first circuit is less than the valley current of said tunnel diode, the current through said first circuit being less than said peak current but higher than said valley current for any said set of voltage signals other than said first and second sets, a second circuit connected to said node between said tunnel diode and said first circuit, the impedance of said second circuit depending on voltage signals applied at said second circuit from said word and bit lines, said second circuit conducting only when a third set of said signals is applied, but non-conducting for any other set of said signals, the current through said conducting second circuit indicative of the voltage across said tunnel diode, thereby providing a read-out of the logic state of the

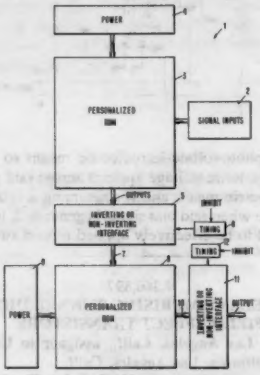
memory cell, said first and second circuits comprsing field effect transistors.

4,360,898

PROGRAMMABLE LOGIC ARRAY SYSTEM INCORPORATING JOSEPHSON DEVICES

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,118
Int. Cl.³ G11C *11/44*
U.S. Cl. 365—162 **33 Claims**



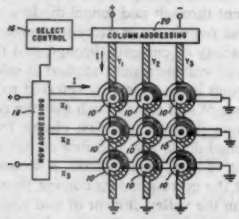
1. A programmable logic array system comprising:
means for generating a plurality of input signals, and,
superconducting read-only memory means connected to said generating means for converting said input signals to output signals different from said input signals for simultaneously storing said input and output signals in said read-only memory means in the absence of further input signals.

4,360,899

MAGNETIC DOMAIN RANDOM ACCESS MEMORY

Magid Y. Dimyan, Richardson, and Carlos A. Castro, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 15, 1980, Ser. No. 121,854
Int. Cl.³ G11C *11/155*
U.S. Cl. 365—171 **10 Claims**



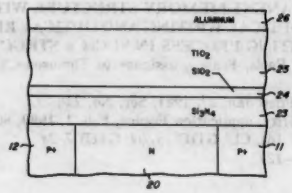
1. A non-volatile random access memory comprising:
a substantially planar non-magnetic substrate;
an array of ferri-magnetic cells formed in a major surface of the substrate, each cell possessing a uniaxial magnetic anisotropy perpendicular to the substrate and being inductively switchable between opposite remanent states;
a row conductor overlying at least a portion of each of the cells in one of the rows in the array;
a column conductor overlying at least a portion of each of the cells in one of the columns in the array, said row and column conductors all lying on the same side of said substrate;
cell select means for simultaneously applying pulses of electrical current to each of the row and column conductors, said pulses being selected to inductively switch only the cell adjacent both the row and column conductors; and
detect means for detecting the remanent state of the cell at the intersection of the row and column conductors.

4,360,900

NON-VOLATILE SEMICONDUCTOR MEMORY ELEMENTS

Robert T. Bate, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 963,855, Nov. 27, 1978, Pat. No. 4,242,737. This application Sep. 2, 1980, Ser. No. 183,531
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—184 **11 Claims**



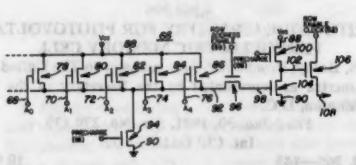
1. A memory element comprising:
a semiconductor body;
a layer of silicon nitride upon said body;
a layer of silicon dioxide upon said nitride layer;
an insulating layer upon said silicon dioxide layer; and
a conducting layer upon said insulating layer.

4,360,901

DECODER CIRCUIT FOR SEMICONDUCTOR MEMORY

Robert J. Proebsting, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/00670, § 371 Date Jun. 2, 1980, § 102(e) Date Jun. 2, 1980, PCT Pub. No. WO81/03573, PCT Pub. Date Dec. 10, 1981
PCT Filed Jun. 2, 1980, Ser. No. 227,053
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—189 **18 Claims**



1. In a semiconductor memory, a decoder circuit for charging a row line selected by a multi-bit memory address, the decoder comprising:
an OR gate having a plurality of input terminals, and an output terminal each input terminal connected to receive a respective bit of said address;
an inverter having an input terminal connected to the output terminal of said OR gate, said inverter also having an output terminal; and
a row driver transistor connected to the output terminal of said inverter and to said row line where the voltage state

on the output terminal of said inverter determines the conductivity of said row driver transistor.

4,360,902

SEMICONDUCTOR MEMORY DECODER WITH NONSELECTED ROW LINE HOLD DOWN

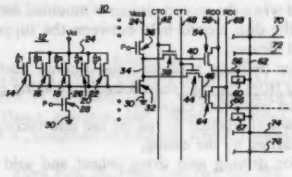
Robert J. Proebsting, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/00674, § 371 Date Jun. 2, 1980, § 102(e) Date Jun. 2, 1980, PCT Pub. No. WO81/03569, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 2, 1980, Ser. No. 231,240

Int. Cl.³ G11C *7/02*

U.S. Cl. 365—189 **8 Claims**



1. In a semiconductor memory having an array of row lines, a decoder circuit comprising:

a row driver transistor for each of said row lines;

means for decoding an address signal for rendering conductive a selected one of said row driver transistors;

means responsive to said address signal for rendering conductive the row driver transistor for the adjacent row line on either side of the row line corresponding to said selected row driver transistor;

means responsive to said address signal for generating a first row driver signal for transmission through said selected row driver transistor to charge the row line connected thereto; and

means responsive to said address signal for generating a second row driver signal for transmission through the row driver transistors for said adjacent row lines to affirmatively hold said adjacent row lines to a low voltage state.

4,360,903

CLOCKING SYSTEM FOR A SELF-REFRESHED DYNAMIC MEMORY

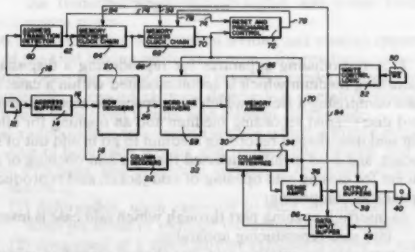
Robert S. Plachno, Lewisville, and Ching-Lin Jiang, Dallas, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/01162, § 371 Date Sep. 10, 1980, § 102(e) Date Sep. 10, 1980, PCT Pub. No. WO82/00915, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 10, 1980, Ser. No. 265,994

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—222 **4 Claims**



1. A method for reading data stored in a memory cell of a self-refreshed dynamic semiconductor memory circuit including clocking circuitry wherein the memory cells are addressed using an address signal comprising the steps of:

detecting changes in the address signal;

generating a memory refresh signal in response to detection of changes in the address signal;

applying the memory refresh signal to the semiconductor memory circuit for refreshing data stored in the memory cells of the semiconductor memory circuit;

after applying the memory refresh signal to the semiconductor memory circuit, applying the address signal to the semiconductor memory circuit for accessing the addressed memory cell to thereby read the data stored therein; and

resetting and precharging the clocking circuitry during application of the refresh signal to the semiconductor memory circuit.

4,360,904

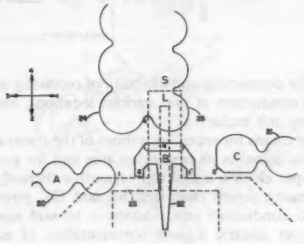
SEGMENTED STRETCHER DETECTOR FOR MAGNETIC BUBBLE DOMAIN DEVICES

Isoris S. Gergis, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 27, 1980, Ser. No. 200,815

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—12 **4 Claims**



1. A magnetic bubble domain device comprising:

an ion implanted propagation path for magnetic bubble domains comprising first and second spaced apart portions;

first replication means disposed adjacent said propagation path comprising a hairpin loop intersecting said propagation path at a substantially right angle and functioning to replicate one of said propagating bubble domain into a pair of magnetic bubble domains and to transfer one of said bubble domains to a first ion implanted secondary track extending in a direction different from said direction of said propagation path;

a permalloy element disposed between first and second portions of said ion implanted propagation path, said permalloy element comprising a pickaxe element, and

functioning to transfer one of said bubble domains into one of said portions of said ion implanted track; and

detection means functioning to detect said magnetic bubble domains.

4,360,905

INTRUSION ALARM SYSTEM FOR USE WITH TWO-WIRE-CABLE

Kenneth R. Hackett, Boulder, Colo., assignor to Pittway Corporation, Northbrook, Ill.

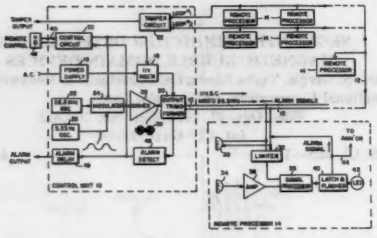
Filed Apr. 16, 1979, Ser. No. 30,554

Int. Cl.³ G08B *13/16*

U.S. Cl. 367—94 **38 Claims**

1. An intrusion alarm system having a plurality of units capable of being interconnected by a cable having only two conductors for detecting the presence of an intruder in a protected area, the system comprising:

a plurality of ultrasonic transmitting units;
a plurality of ultrasonic receiving units;
a control unit including:
signal means for applying an ultrasonic frequency AC signal to said two conductors of said cable;
means for applying DC power to said two conductors; and
means for detecting an alarm signal applied to said two conductors by one of said receiving units and for producing an alarm indication in response to the detection of an alarm signal;
means for connecting said plurality of transmitting units to said cable conductors at various locations in said protected area and responsive to the AC signal on said conductors for transmitting an ultrasonic signal into respective locations in the protected area; and



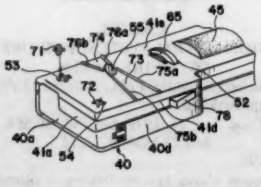
means for connecting said plurality of receiving units to said cable conductors at said various locations, each said receiving unit including:
sensor means for receiving echoes of the transmitted ultrasonic signal in its respective area and for producing an output electric signal representative thereof;
processing means energized by said DC power on said two conductors and responsive to said sensor means output electric signals representative of echoes produced by an intruder for producing an output signal representative thereof; and
alarm means including an indicator operable to increase the current drawn from said cable for applying said increased current as said alarm signal to said cable conductors in response to said output signal from said processsing means representative of an intruder presence, said increased current producing said alarm indication at said control unit.

4,360,906

SELF-PROPELLED RECORD CLEANER

Katuaki Shitama, Nogata, Japan, assignor to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Filed Mar. 23, 1981, Ser. No. 246,589
Claims priority, application Japan, Mar. 22, 1980, 55/37592[U]
Int. Cl.³ G11B *3/58*
U.S. Cl. 369—72 **5 Claims**



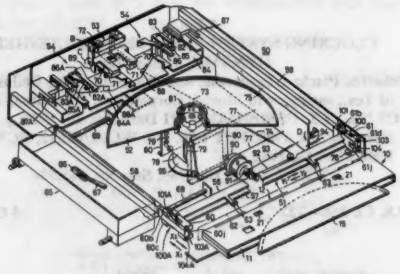
1. A self-propelled record cleaner for cleaning a disc record having a center opening, a non-grooved area coaxial with the center opening, a grooved area coaxial with the center opening and positioned on one side of the non-grooved area opposite to the center opening and an outer peripheral margine, all being defined on at least one surface of the disc record, said disc record being mounted on a support having a spindle which, when the disc record is so mounted with said at least one surface thereof facing in a direction opposite to the support, projects through the center opening, said self-propelled record cleaner comprising, in combination:
a generally elongated casing having a dust collecting chamber defined therein said casing also having a bearing hole defined therein at a position adjacent to one end thereof for engagement with the spindle when the record cleaner is in use;
a generally cylindrical cleaning element supported in the casing so as to extend in a radial direction of the disc record when the record cleaner is mounted on the support with the disc record held between the support and the record cleaner;
means for defining a passage for guiding dusts being removed from the disc record by the cleaning element into the dust collecting chamber;
a drive wheel adapted to run on the disc record and rotatably carried by the casing;
means for driving said drive wheel and said cylindrical cleaning element in opposite directions with each other;
at least two roller elements operatively carried by the casing in spaced relation to each other and also to drive wheel to provide a three-point support system for the record cleaner in cooperation with the drive wheel;
all of said drive wheel, said driving means and said roller elements being supported in one end portion of the casing around the bearing hole.

4,360,907

DISC-SHAPED RECORDING MEDIUM REPRODUCING APPARATUS

Takashi Yamamura, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 24, 1981, Ser. No. 257,165
Int. Cl.³ G11B *3/02*; H04N *5/76*
U.S. Cl. 369—77 **7 Claims**



1. A reproducing apparatus for reproducing a disc-shaped recording medium which is accommodated within a case, said case comprising a jacket which has a space for accommodating said disc-shaped recording medium and an opening for allowing said disc-shaped recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said reproducing apparatus comprising:
an inserting opening part through which said case is inserted into said reproducing apparatus;
a turntable for rotating said disc-shaped recording medium;
clamping means for clamping at least one of said disc-shaped recording medium or said lid member provided at the

innermost part on the opposite side from said inserting opening part with respect to said turntable;

a pair of guide rails provided extending between a position of said inserting opening part and a position at an innermost part of said reproducing apparatus, at right and left sides of a moving passage of said case; and

slider means inserted with said pair of guide rails therethrough, said slider means being freely slidable along said pair of guide rails, and engaging with said case and moving in response to the inserting and pulling out operation of said case,

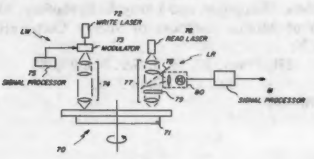
said slider means having main slider bodies respectively inserted with said pair of guide rails therethrough, and having arm portions which oppose the upper and lower surfaces of said guide rails, and rollers provided at said arm portions of said main slider body, said rollers rolling over said guide rails.

4,360,908

PHYSICALLY OPTIMIZED OPTICAL DISC STRUCTURE, METHOD AND APPARATUS

Dennis G. Howe, Fairport, and Joseph J. Wrobel, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,381
Int. Cl.³ G11B *7/00, 7/24, 7/26*
U.S. Cl. 369—109 **37 Claims**



1. For use with predetermined optical writing and reading apparatus which employs a laser writing beam and a laser reading beam of a preselected read wavelength, an element constructed for improved writing and reading comprising:

(a) a support having a smooth surface which is highly reflective of both such writing and reading laser beams; and

(b) overlying said reflective surface, a recording stratum which is:

(1) deformable, upon exposure to such writing beam, to form pit zones of reduced recording stratum thickness;

(2) composed of a material that exhibits, relative to such preselected read wavelength and in cooperation with said reflective layer, a reflected-reading-beam-phase-shift versus recording-stratum-thickness curve which is non-linear and characterized by a lower thicknesses zone of relatively steep slope and an adjacent higher thicknesses zone of relatively gradual slope; and

(3) of a nominal, unpitted, thickness which is proximate the transition between said higher and lower thicknesses zones.

16. In combination with optical writing and reading apparatus of the kind having write/read means for producing a laser writing beam and a laser reading beam of a predetermined read wavelength, a record element disposed in operative relation with said write/read means, said element comprising:

(a) a support having a smooth surface which is highly reflective of both such writing and reading laser beams; and

(b) overlying said reflective surface, a recording stratum which is:

(1) deformable, upon exposure to such writing beam, to form pit zones of reduced recording stratum thickness;

(2) composed of a material that exhibits, relative to such predetermined read wavelength and in cooperation with said reflective layer, a reflected-reading-beam-phase-shift versus recording-stratum-thickness curve which is non-linear and characterized by a lower thicknesses zone of relatively steep slope and an adjacent higher thicknesses zone of relatively gradual slope; and

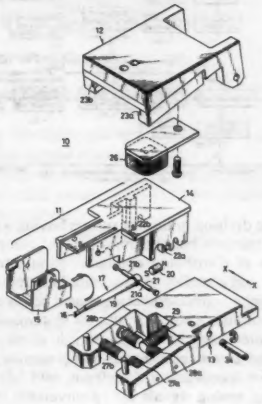
(3) of a nominal, unpitted, thickness which is proximate the transition between said higher and lower thicknesses zones.

4,360,909

SIGNAL PICKUP DEVICE IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Osamu Tajima, Kanagawa, Japan, assignor to Victor Company of Japan Ltd., Japan

Filed Dec. 29, 1980, Ser. No. 220,530
Claims priority, application Japan, Dec. 29, 1979, 54/185160[U]
Int. Cl.³ G11B *3/38, 21/00, 21/10, 11/02*
U.S. Cl. 369—170 **8 Claims**



1. A signal pickup device comprising:

a reproducing element for reproducing recorded signals from recording tracks of a rotary recording medium;

a holder having said reproducing element mounted at its tip end;

a cantilever having the rear end of said holder mounted at its tip end;

force applying means for applying a force to the rear end side of said cantilever so that said reproducing element makes contact with said rotary recording medium having a predetermined pressure; and

control means for applying force at the rear end side of said cantilever so that tracking control is performed, by displacing said reproducing element in a direction perpendicular with respect to the longitudinal direction of the recording tracks of said rotary recording medium, said cantilever, holder and reproducing element constructing a cantilever assembly,

said holder forming a plate-shaped member in which the width in the direction substantially parallel to the rotating surface of said rotary recording medium is larger than the thickness in the direction perpendicular to said rotating surface,

said holder and said cantilever assembly having a first resonance frequency respective of their spring constant and moment of inertia wherein said resonance frequency is selected at a frequency lower than a frequency f_c at which the response of the open servo loop characteristic of said control means becomes zero, and said cantilever having a second resonance frequency at the plane substantially parallel to the rotating surface of said rotary recording medium selected at a frequency

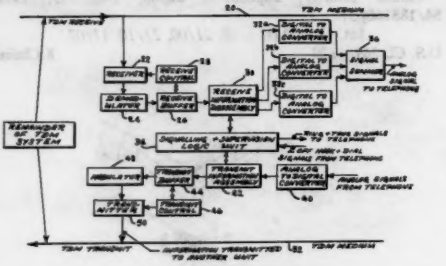
higher than said frequency f_c at the rear end side thereof.

4,360,910

DIGITAL VOICE CONFERENCING APPARATUS IN TIME DIVISION MULTIPLEX SYSTEMS

Joshua L. Segal, Chelmsford, and Charles F. Sargent, Boston, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 23, 1980, Ser. No. 171,916
Int. Cl.³ H04J *3/02*; H04M *3/56*
U.S. Cl. 370—62 **3 Claims**



1. In a time division multiplex system having a unidirectional receive and transmit bus the improvement comprising:

a plurality of distributed communication interfacing units, each of said plurality of distributed communication interfacing units connected between said receive and transmit bus to said time division multiplex system, each communication interfacing unit comprising in combination:

a telephone means converting audio signals to an analog signal for transmission therefrom, said telephone means receiving analog signals for reconversion into audio signals,

means for adapting said time division multiplex system, said adapting means connected between said receive and transmit bus, said adapter means connected to said telephone means to receive analog signals therefrom and to transmit analog signals thereto, said adapter means converting said analog signals from said telephone means to digital message packets, said adapter means transmitting said digital message packets on said transmit bus to said time division multiplex system, said adapter means receiving digital message packets from said time division multiplex system by means of said receive bus, said adapter means converting said digital message packet to an analog signal and applying said analog signal to said telephone means, and,

a summing means connected between said telephone means and said adapter means, said summing means only summing the signals passing from said adapter means to said telephone means.

4,360,911

DIGITAL SIGNAL SWITCH SYSTEM HAVING SPACE SWITCH LOCATED BETWEEN TIME SWITCHES

John H. M. Hardy, The Hague, Netherlands, assignor to The Post Office, London, England

Filed Nov. 7, 1978, Ser. No. 958,417
Claims priority, application United Kingdom, Nov. 7, 1977, 46296/77
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—63 **8 Claims**

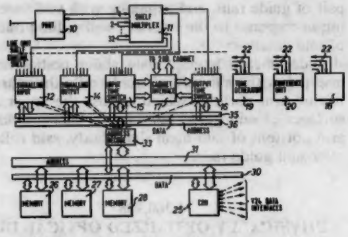
1. A digital switching device for switching input digital signals under the control of a central control unit, said device having:

an input time switching stage,

an output time switching stage,

a space switching stage intermediate the input and output time switching stages,

each time switching stage including a connection store for controlling reading of data signals from its respective time switching stage, and



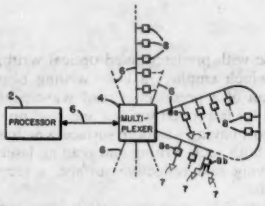
said space switching stage including comparing means for comparing the contents of the connection stores of the time switching stages, the operation of the space switching stage being controlled on the basis of said comparison.

4,360,912

DISTRIBUTED STATUS REPORTING SYSTEM

Louis C. Metz, Shoreview, and Leroy A. Prohofsky, Minneapolis, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 23, 1979, Ser. No. 97,080
Int. Cl.³ H04J *3/02*
U.S. Cl. 370—96 **9 Claims**



1. A status reporting system, comprising:

a plurality of communication buses;

a plurality of data points;

a plurality of transmitter means, each coupling at least an associated one of said data points to an associated one of said communication buses for transmitting signals therebetween;

processor means;

multiplexer means coupled to said processor means and said plurality of communication buses for simultaneously coupling an address signal to said plurality of communication buses, said address signal simultaneously selecting only an addressed one of the plurality of data points that are coupled to each of said communication buses;

at least a predetermined one of said plurality of transmitter means selected for coupling at least two of said data points to the associated communication bus; and

each of said transmitter means, data point combinations including means for generating a status response signal when said address signal selects the addressed one of said data points and for simultaneously coupling the status response signal from each of the addressed ones of said data points to said communication buses and thence to said

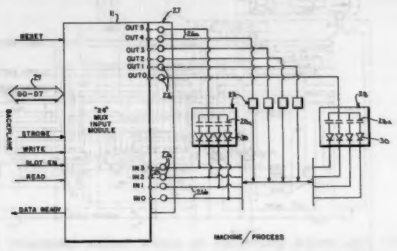
multiplexer for transmission to said processor means in a modified form.

4,360,913

MULTIPLEXING I/O MODULE

Odo J. Struger, Chagrin Falls, and Ronald A. Brown, Willowick, both of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Mar. 17, 1980, Ser. No. 131,126
Int. Cl.³ H04J *6/00*
U.S. Cl. 370—112 **11 Claims**



1. An I/O module adapted for connection between an I/O bus and a plurality of I/O devices and responsive to control signals from a main processor for coupling address signals from the I/O bus to first and second I/O devices in succession to multiplex or demultiplex two respective groups of I/O data bit signals that are coupled between the I/O devices and the I/O module and to couple these I/O data bit signals through the I/O bus during a single word transmission time in a multibit word of I/O data signals formed of the two groups of I/O data bit signals, the I/O module comprising:

first means responsive to a first control signal from the main processor for coupling the I/O address signals received from the main processor through the I/O bus to first and second I/O devices in succession;

second means for temporarily storing I/O data bit signals on the I/O module;

third means responsive to the first control signal from the main processor for coupling the first group of I/O data bit signals between the first I/O device and the second means, and for then coupling a second group of I/O data bit signals between the second I/O device and the second means; and

fourth means connected to the third means and responsive to a second control signal from the main processor to couple the multibit word of I/O data signals between the second means and the I/O bus during the single word transmission time, wherein the multibit word of I/O data signals is formed of the first group of I/O data bit signals and the second group of I/O data bit signals.

4,360,914

PROCESS AND AN APPARATUS FOR TRANSFERRING INFORMATION REPRESENTING AT LEAST TWO PARAMETERS

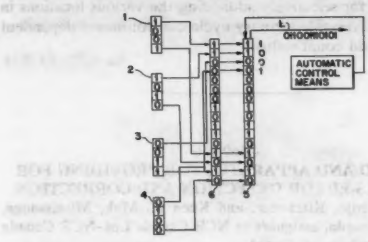
Lars V. Brock-Nannestad, Virum, Denmark, assignor to Forsvarets Forskningstjeneste, Denmark

PCT No. PCT/DK79/00054, § 371 Date Jul. 25, 1980, § 102(e) Date Jul. 25, 1980, PCT Pub. No. WO80/01228, PCT Pub. Date Jun. 12, 1980
PCT Filed Nov. 30, 1979, Ser. No. 201,072
Claims priority, application Denmark, Dec. 1, 1978, 5471/78
Int. Cl.³ G06F *3/14*
U.S. Cl. 371—2 **3 Claims**

1. A method for transferring from data sources bits of information relating to a plurality of parameters, each of said parameters being defined by digits having a weight associated therewith, wherein the weight of each digit corresponds to its importance, the most important digit having the highest weight, the second most important digit having a lower weight, and so on said method comprising the steps of:

(a) arranging the digits of each data source by weight;

(b) transferring the digits into a multi-section memory bank by placing all the digits with the highest weight from each data source in a first section, all the available digits with



the second highest weight in a second adjacent section and so on;

(c) reading the digits out of said memory bank serially in descending weight sequence; and,

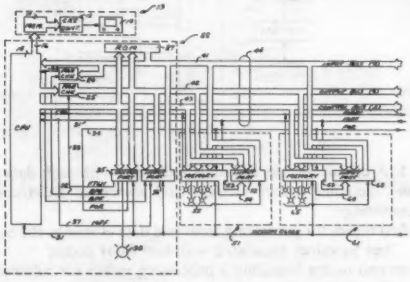
(d) terminating the out reading of digits from said memory bank when said parameters have been read with a predetermined accuracy.

4,360,915

ERROR DETECTION MEANS

Emmett F. Sindelar, Moreland Hills, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Continuation of Ser. No. 9,901, Feb. 7, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 196,890
Int. Cl.³ G06F *11/10*; G11C *29/00*
U.S. Cl. 371—13 **5 Claims**



1. Apparatus for detecting a read-out error in a multibit word having a parity bit added thereto and outputted from a memory in response to a memory read signal applied thereto, comprising:

(a) parity bit error detector means for detecting a parity bit error in a said outputted word and providing a parity error signal in response thereto; and,

(b) means responsive to a said parity error signal for providing a second memory read signal for a second successive application to said memory whereby said parity bit error detector means again operates to determine whether parity error is present in the outputted word;

(c) addressable memory cycle control means storing control commands at various addressable locations therein;

(d) an input address circuit means for receiving address signals for selectively addressing various of said locations in said addressable memory cycle control means and being

responsive to a memory read signal for addressing a location in said addressable memory cycle control means for causing a control command to be outputted therefrom and which also serves as a count enable command; and,

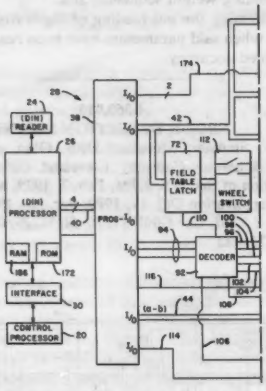
(e) actuatable counting means actuated to a counting condition in response to said count enable command for counting regularly occurring clock pulses and providing a count output which varies with the count status, said input address circuit means being also responsive to a said count output for selectively addressing the various locations in said addressable memory cycle control means dependent upon said count status.

4,360,916

METHOD AND APPARATUS FOR PROVIDING FOR TWO BITS-ERROR DETECTION AND CORRECTION

Simon Kustedjo, Kitchener, and Kuen H. Mak, Mississauga, both of Canada, assignors to NCR Canada Ltd.-NCR Canada Ltee., Mississauga, Canada

Filed Dec. 31, 1979, Ser. No. 108,876
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 16 Claims



1. A circuit for use with data elements, with each data element including a data message and associated BCH codes, comprising:

first means for generating from said data elements, the S_1, S_2 and S_3 values associated with said BCH codes;

second means including a processing means for calculating the quotient of

$$\frac{S_3}{S_1},$$

wherein S_3 is considered as α^a and S_1 is considered as α^b;

said second means including a Galois field table being arranged in an anti-log and log format to enable said processing means to calculate said quotient by subtracting the log of α^b obtained from said Galois field table from the log of α^a obtained from said Galois field table to produce a resulting log which is used to obtain a resulting anti-log value A from said Galois field table; and

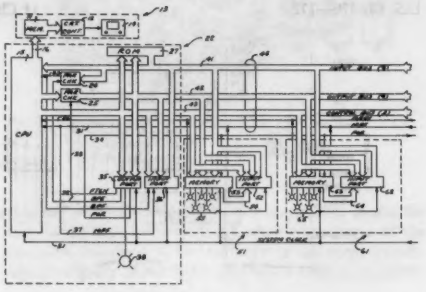
third means including said processing means for receiving said S_1, S_2, S_3 values and said anti-log value A and also for determining therefrom the locations of a predetermined number of errors (if any) in a said data element.

4,360,917

PARITY FAULT LOCATING MEANS

Emmett F. Sindelar, Moreland Hills, and Lawrence R. Ober, Chagrin Falls, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Continuation of Ser. No. 10,077, Feb. 7, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 196,510
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 1 Claim



1. A method for isolating data errors in a logic system having memory means and data transmission means, for transmitting data from the memory means to a utilization device, comprising the steps of:

(a) checking the data from said memory means for data errors before transmitting to the utilization device and inhibiting transmission if a data error is present;

(b) storing a logic state indicative of the presence of a data error in the data from said memory means in a first register means;

(c) checking the data transmitted from the memory means by the transmission means for data errors;

(d) storing a logic state indicative of the presence of a data error in the data from said transmission means in a second register means;

(e) reading the logic states of said first and second register means; and,

(f) displaying a visual indicia indicative of the logic states of said first and second register means.

4,360,918

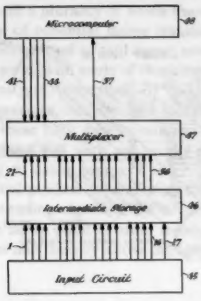
ARRANGEMENT FOR DETECTING DEFECTS DURING THE ASYNCHRONOUS TRANSFER OF DIGITAL MEASURED VALUES

Garhard Ruhnau; Klaus Pape, and Rudolf Auding, all of Hanover, Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 18, 1980, Ser. No. 179,355
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936439
Int. Cl.³ G06F *11/00*; B60T *8/00*
U.S. Cl. 371—69 1 Claim

1. An arrangement for recognizing errors during the asynchronous transmission of digital measured values into a microcomputer comprising, an input circuit for producing the digital measured values, a plurality of data lines coupled between said input circuit and an intermediate storage circuit for feeding the digital measured values in parallel into said intermediate storage circuit in response to a pulse on a control line, a plurality of output lines coupled between said intermediate storage circuit and a multiplexer for feeding the digital measured values in parallel into said multiplexer, a common data line coupled between said multiplexer and a microcomputer for providing a first dual transmission of two successive digital measured values serially into said microcomputer in response

to signals on a plurality of address lines leading from said microcomputer to said multiplexer, and said microcomputer compares the first measured values with the second measured values of said first dual transmission to determine equality for causing further processing by said microcomputer when equality exists and for causing a second dual transmission of the



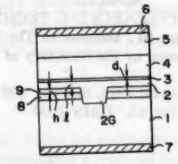
digital measured values when an inequality exists and also when the digital measured values lie outside the limits of an upper and lower boundary values and produces an error signal to prevent further processing when an inequality exists in both dual transmissions and also when the digital measured values of both transmissions lie outside of the upper and lower boundary values.

4,360,919

SEMICONDUCTOR LIGHT EMITTING DEVICE

Takao Fujiwara; Kiyoshi Hanamitsu, both of Sagamihara; Sigeo Ohsaka, Kawasaki; Hiroshi Ishikawa, Tokyo; Nobuyuki Takagi, Yokohama, and Katsuharu Segi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 10, 1980, Ser. No. 185,806
Claims priority, application Japan, Sep. 11, 1979, 54-116320
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 **18 Claims**



1. In a semiconductor light emitting device, the device comprising:

a first growth layer having a low refractive index and a thickness l;

an active layer comprising a second growth layer having a high refractive index; and

a third growth layer of a low refractive index, all formed on a semiconductor compound substrate having a striped hollow formed therein and a current confining barrier formed around the hollow, said current confining barrier comprising:

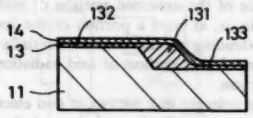
an intermediate layer having a high refractive index, and a thickness h, and a low refractive index layer being disposed on the surface of the substrate outside said hollow, whereby a first specified light mode is formed, such that with a second specified light mode formed by said active layer, light emitted from said active layer is essentially confined due to a difference in the effective refractive index between the portion of said active layer overlying said hollow and the remaining portion of said active layer.

4,360,920

TERRACED SUBSTRATE SEMICONDUCTOR LASER

Masaru Wada, Takatsuki; Hirokazu Shimizu, Toyonaka; Takashi Sugino, Takatsuki, and Kunio Itoh, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 10, 1980, Ser. No. 185,922
Claims priority, application Japan, Sep. 18, 1979, 54-119891
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 **4 Claims**



1. In a semiconductor laser, the improvement comprising a terrace-shaped semiconductor substrate having an upper face, a lower face and a step part disposed between said upper face and said lower face,

a clad layer formed on said substrate includes an upper part, a lower part and a central part, said upper part being on said upper face, said lower part being on said lower face, and said central part connecting said upper and lower parts and being thicker than said upper part and said lower part in a manner that a step-shaped downward bending surface of said central part is located above said lower face,

an active layer formed on said clad layer includes an upper lateral part, a lower lateral part, a center part connecting said upper and said lower lateral parts, a lasing region being a part of said upper lateral part near a bending part on said step-shaped downward-bending surface, and

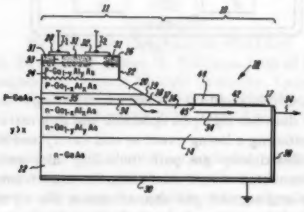
a current injection electrode is disposed above said lasing region.

4,360,921

MONOLITHIC LASER SCANNING DEVICE

Donald R. Scifres, Los Altos; Robert D. Burnham, Los Altos Hills, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1980, Ser. No. 187,912
Int. Cl.³ H01S 3/19
U.S. Cl. 372—50 **17 Claims**



1. A monolithic laser scanning device comprising:

a heterostructure injection laser region and optical scanning region,

said laser region including an active layer, a pair of passive waveguide layers, each contiguous with a surface of said active layer, one of said passive waveguide layers extending from said laser region into said optical scanning region, a cladding layer contiguous with the other surface of each of

said passive waveguide layers, said active layer having a narrower bandgap and higher index than any of the other of said layers and wherein the radiation propagating cavity and the means for feedback of said radiation are transverse to the elongated extent of said regions, grating means in a portion of the contiguous interface between the other of said passive waveguide layers and its contiguous cladding layer to redirect the propagation of said radiation in said cavity in a direction parallel to the elongated extent of said regions, and means to couple said radiation from said active layer into said one passive waveguide layer for propagation along the extended portion thereof,

said optical scanning region including periodic array of substantially parallel, spaced electrodes associated with one major surface of the extended portion of said one passive waveguide layer, at least a portion of the lengths of said electrodes extending in a direction substantially parallel with the direction of propagation of said radiation in said extended direction,

means to apply voltages in a pattern to said electrodes which vary to a predetermined value over several of said electrodes and wherein the same pattern of voltages or a similar pattern of different voltages is applied over several of the next electrodes whereby the pattern is completed across said array to produce a corresponding stepwise approximation of a desired phase retardation along the phase front of said radiation and

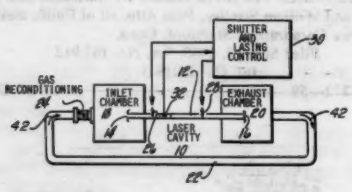
means to continually change the magnitude of said applied voltages across said electrodes to vary the stepwise approximation of the phase retardation along said phase front to cause said radiation to scan in a direction transverse to the direction of propagation of said radiation in said extended portion.

4,360,922

PRESSURE WAVE CHARGED REPETITIVELY PULSED GAS LASER

Vijay A. Kulkarny, Redondo Beach, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 29, 1980, Ser. No. 201,959
Int. Cl.³ H01S 3/03
U.S. Cl. 372—89 9 Claims



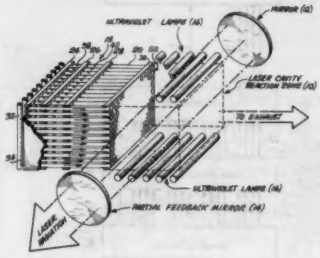
1. In a repetitively pulsed gas laser comprising a lasing cavity in a laser duct having open upstream and downstream ends, means for initiating a lasing event in said cavity and means for defining a closed loop gas path including inlet and exhaust chambers connected to said duct ends, the improvement comprising first and second gas shutter means for opening and closing said duct to the passage of gas and pressure pulses therethrough disposed in spaced relation along said duct on opposite sides of said cavity between said open ends, and control means coupled to said initiating means and to said shutter means for sequentially operating said first and second shutter means so as to stabilize gas pressure in said cavity preparatory to lasing events and utilize pressure waves caused by lasing events to draw fresh lasing medium into said cavity after lasing events.

4,360,923

REAGENT TAILORING FOR A CHEMICAL GAS LASER TO OBTAIN UNIFORM INITIAL CHEMICAL REACTION RATE

William J. Thayer, III, and Carmine J. Artura, both of Kent, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 3, 1979, Ser. No. 99,334
Int. Cl.³ H01S 3/05
U.S. Cl. 372—89 15 Claims



1. A method of providing a uniform initial chemical reaction rate in a chemical gas laser wherein a chemical reaction between gaseous reactant species produces excited reaction product species, said laser including a resonant laser cavity and an external source of radiation for initiating said reaction in said cavity by irradiating said gaseous reactant species in a direction of irradiation transverse to the axis of laser emission of said laser, comprising:

forming a stream of said gaseous reactant species flowing through said cavity in a direction substantially transverse to said axis of laser emission;

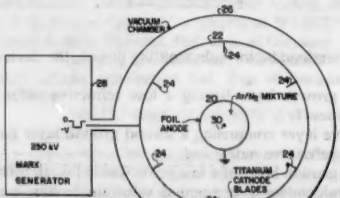
varying the concentration of at least one of said gaseous reactant species across said cavity in a direction transverse to the direction of flow of said stream and parallel to the direction of irradiation of said external source of radiation, thereby compensating for attenuation of said radiation within said stream to provide a substantially uniform initial chemical reaction rate within said stream.

4,360,924

LASER BOTTLENECKING TECHNIQUE

J. Gary Eden, Urbana, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1980, Ser. No. 199,895
Int. Cl.³ H01S 3/00
U.S. Cl. 372—91 18 Claims



1. A technique for causing a gas lasing device including an optical cavity having a plurality of reflecting surfaces to strongly lase a gas in a gas chamber from a desired vibrational level in an upper populated electronic energy state, to a lower electronic energy state via a low probability optical transition

in order to obtain a desired frequency of stimulated light emission comprising the steps of:

choosing the reflecting surface at one end of said lasing device to have a maximum transmission characteristic for the desired light frequency;

introducing a lasing gas having an upper electronic energy state with a desired vibrational level and a lower electronic energy state with a plurality of levels therein such that there are a plurality of potential lasing transitions between said desired vibrational level of said upper energy state and said lower energy state, with some of these transitions being high gain transitions and with some of these transitions being lower gain transitions, there being a specific energy required to bottleneck these high gain transitions;

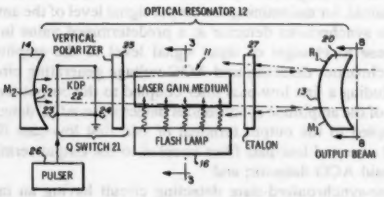
pumping said lasing gas with an energy pulse of sufficient power density to cause lasing of the high gain transitions during the initial portion thereof with the width of the energy pulse extending significantly beyond this initial high gain transition lasing point in order to bottleneck these high gain transitions and thereby allow the lower gain transitions to oscillate.

4,360,925

LASER EMPLOYING AN UNSTABLE RESONATOR HAVING AN OUTPUT TRANSMISSIVE MIRROR

Stephen J. Brosnan, and Richard L. Herbst, both of Menlo Park, Calif., assignors to Quanta Ray, Inc., Mountain View, Calif.

Filed Feb. 25, 1980, Ser. No. 124,586
Int. Cl.³ H01S *3/081*
U.S. Cl. 372—95 **13 Claims**



1. In a laser:

optical resonator means for excitation with electromagnetic energy for resonance at a resonant optical wavelength and having at least first and second optical reflector means disposed along an optical axis of said resonator means for reflecting resonant optical energy generally along the optical axis to another one of said reflector means;

laser gain medium means for disposition within said optical resonator means for providing gain to the electromagnetic energy within said optical resonator means at said resonant optical wavelength; and

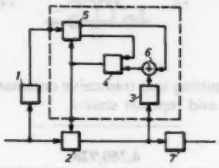
said optical resonator means comprising a positive branch unstable resonator and wherein said first optical reflector means disposed on said optical axis of said optical resonator means has a first reflective surface for reflecting resonant optical energy to said second optical reflector means, said first reflector surface being partially transmissive for coupling an output beam of coherent resonant optical energy from said optical resonator means through said first partially transmissive surface of said first reflector means as a filled-in beam of generally uniform transverse cross sectional power density.

4,360,926

DIGITAL PHASE-LOCKED LOOP

Jan S. Hedin, Tumba, and Göran A. Jarnestedt, Johanneshov, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE79/00205, § 371 Date Jun. 13, 1980, § 102(e) Date May 30, 1980, PCT Pub. No. WO80/00904, PCT Pub. Date May 1, 1980
PCT Filed Oct. 12, 1979, Ser. No. 196,053
Claims priority, application Sweden, Oct. 13, 1978, 7810736
Int. Cl.³ H04L *7/08*
U.S. Cl. 375—120 **1 Claim**



1. In a data transmission system for transmitting redundantly coded digital information, a digital phase-locked loop apparatus comprising: a data detector means for detecting redundantly coded information received at a data input in response to sampling pulses received at a sampling input; a digitally controlled oscillator means having an output connected to said sampling input for generating sampling pulses and having first and second inputs for changing the frequency of the sampling pulses in opposite directions in accordance with which of said inputs receives a pulse signal; a digital phase comparator means having first and second inputs for receiving, respectively, pulse signals related to the received redundantly coded digital information and the sampling pulses from the output of said digitally controlled oscillator means, and first and second outputs for transmitting pulse signals from either one of said outputs in accordance with which of the two signals received at said inputs leads in phase, said first output being connected to the first input of said digitally controlled oscillator means; an error detector means connected to said data detector means and having an output for emitting a pulse signal whenever the inherent redundant properties of the digital information are absent; and pulse signal adder means having a first input connected to the output of said error detector means, a second input connected to the second output of said digital phase comparator means, and an output connected to the second input of said digitally controlled oscillator means.

4,360,927

REPEATER TRUNKING SYSTEM

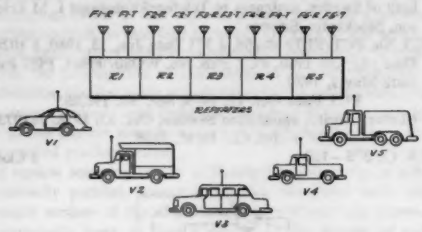
William A. Bowen, and James W. Williams, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Mar. 12, 1979, Ser. No. 129,645
Int. Cl.³ H04B *7/14, 1/00, 1/44*
U.S. Cl. 455—17 **30 Claims**

27. A trunking radio transceiver including channel acquisition control means that, when in an idle mode, continuously and automatically scans for possible calling signals and busy-marking signals on each of plural channels and that, when in a call-originate mode, automatically scans for an idle unmarked channel in response to a call originate request signal and transmits a busy-marking signal to a repeater station over a detected previously unmarked idle channel and requires receipt of an answer-back acquisition control signal from the repeater station over that same channel before permitting transceive communication of information thereover via said repeater station, and wherein said channel acquisition control means comprises:

answer-back control means requiring receipt of an answer-

back acquisition control signal from the repeater station but different in information content from said busy signal,



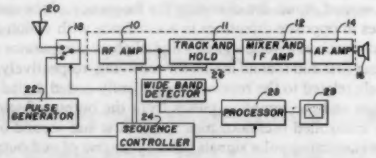
before permitting said transceive communication of information via said repeater station.

4,360,928

NON-INTERFERING ON-LINE RECEIVER TEST SYSTEM

Kenneth J. Campbell, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1974, Ser. No. 459,523
Int. Cl.³ H04B *17/00*
U.S. Cl. 455—226 **5 Claims**



1. A system for providing noise figure testing of receivers without interfering with their normal operation and providing valid results while signals are being received, the combination comprising:

(a) a receiver including a receiving antenna, an RF amplifier, a mixer and IF amplifier stage and having a track and hold circuit connecting the output of said RF amplifier to the input of said mixer and IF amplifier stage;

(b) signal detecting means coupled to the output of the RF stage of said receiver;

(c) pulse signal generating means;

(d) switching means for coupling said receiver to said receiving antenna and to said pulse generator;

(e) sequence controller means coupled to said pulse generating means, to said switching means and to said track and hold circuit means, said sequence controller means sequentially disconnecting the antenna from said receiver and connecting said pulse signal generating means to said receiver so that signals of two different values will be detected by said detecting means;

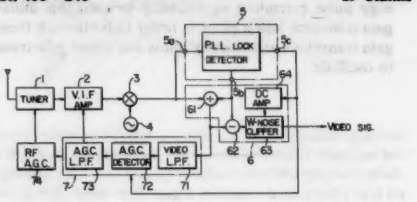
(f) and processing circuit means coupled to said sequence controller and to said detecting means for providing an output signal in response to the two detected values that is proportional to the noise figure of the receiver.

4,360,929

AUTOMATIC GAIN CONTROL CIRCUIT

Mitsuo Isobe, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 17, 1980, Ser. No. 160,325
Claims priority, application Japan, Jun. 22, 1979, 54-79433; Aug. 20, 1979, 54-106304; Sep. 3, 1979, 54-112573
Int. Cl.³ H04N *5/52*
U.S. Cl. 455—245 **19 Claims**



1. An automatic gain control (AGC) circuit comprising:

an amplitude synchronous detector for synchronously detecting an amplitude-modulated signal applied to the input terminal thereof and for producing a demodulated output signal from the output terminal thereof;

an AGC voltage generating circuit having an input terminal coupled to the output terminal of said amplitude synchronous detector, an output terminal coupled to the input terminal of the amplitude synchronous detector, and a control terminal, for maintaining the output signal level of the amplitude synchronous detector at a predetermined value in response to changes of input signal level to the amplitude synchronous detector, said AGC voltage generating circuit including a first low-pass filter coupled to the output terminal of the amplitude synchronous detector, an AGC detector coupled to the output terminal of said first low-pass filter and a second low-pass filter coupled to the output terminal of said ACG detector; and

a phase-synchronized-state detecting circuit having an input terminal coupled to the output terminal of the amplitude synchronous detector, and an output terminal coupled to the control terminal of said AGC voltage generating circuit, for detecting an asynchronous state of the amplitude synchronous detector and for producing a control signal which is applied to the AGC voltage generating circuit in response to the detection of said asynchronous state to prevent a malfunction of the ACG voltage generating circuit.

DESIGNS

GRANTED NOV. 23, 1982

ERRATA

For CLASS	See PATENT NO.
D99–033	267,047
D47–006	267,048
D34–029	267,049

DESIGNS

NOVEMBER 23, 1982

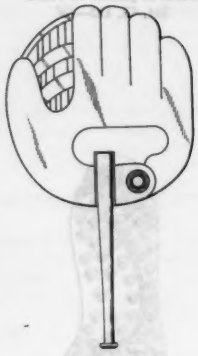
266,965
SLACKS
Michael Rofrano, 9026 White Oak Ave., Northridge, Calif. 91325
Filed Jun. 30, 1980, Ser. No. 164,056
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

266,966
SPORT SHOE
Masanobu Inohara, Akashi, Japan, assignor to Asics Corporation, Kobe, Japan
Division of Ser. No. 911,443, Jun. 1, 1978. This application Jul. 28, 1980, Ser. No. 172,717
Claims priority, application Japan, Dec. 22, 1977, 52-51072
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

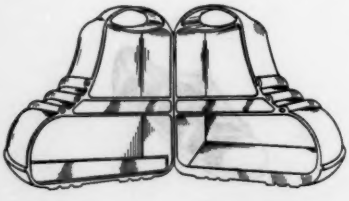
266,967
SPORT SHOE SOLE UNIT
Masanobu Inohara, Akashi, Japan, assignor to Asics Corporation, Kobe, Japan
Division of Ser. No. 911,443, Jun. 1, 1978. This application Jul. 28, 1980, Ser. No. 172,719
Claims priority, application Japan, Dec. 22, 1977, 52-51072
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

266,968
SHOE UPPER
Jeremy J. Railton, Los Angeles, Calif., assignor to Jungle Feet, Los Angeles, Calif.
Filed Apr. 21, 1980, Ser. No. 142,067
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—326

266,969
FAN
LaDon W. Pope, c/o Johnson & Gordon Janitor Service, 1632 Central Pkwy., Cincinnati, Ohio 45210
Filed Apr. 18, 1980, Ser. No. 141,393
Term of patent 14 years
Int. Cl. D3—*04*
U.S. Cl. D3—4

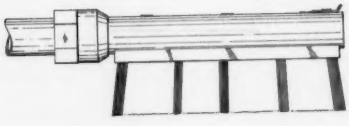


266,970
CASE FOR SHOE SHINING ARTICLES OR THE LIKE
Josef Lilbob, Gartenstrasse 4, D 7766 Gaienhofen 2, Fed. Rep. of Germany
Filed Apr. 3, 1980, Ser. No. 136,983
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, MR147R
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30.5

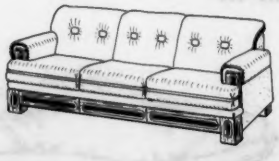


266,971
LUGGAGE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Filed Apr. 2, 1979, Ser. No. 25,806
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

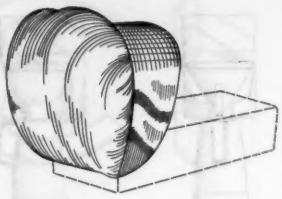
266,972
CHIMNEY SWEEP BUSH
Ronald R. Bolt, P.O. Box 832, Drain, Oreg. 97435
Filed Jun. 26, 1980, Ser. No. 163,621
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—12



266,973
SEAT
Milton A. Wilder, Rogersville, Tenn., assignor to Bean Station Furniture Factory, Bean Station, Tenn.
Filed Aug. 8, 1980, Ser. No. 176,492
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



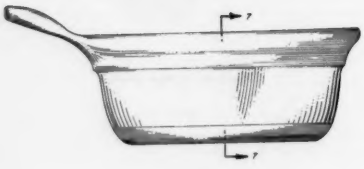
266,974
CANOPY FOR BED
Jackilyn R. Wilks, 3224 Highway 20, Space 16, Sweet Home, Oreg. 97386
Filed Aug. 11, 1978, Ser. No. 933,120
Term of patent 14 years
Int. Cl. D6—*01, 13*
U.S. Cl. D6—198

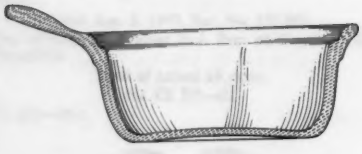


266,975
DINNER PLATE
Walter Everhan, Klettenberg, Fed. Rep. of Germany, assignor to American Commercial Incorporated, Gardena, Calif.
Filed Aug. 12, 1980, Ser. No. 177,418
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—1

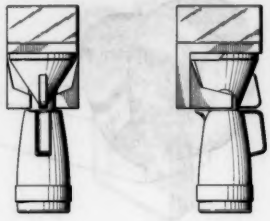
266,976
TEACUP
Walter Everhan, Klettenberg, Fed. Rep. of Germany, assignor to American Commercial Incorporated, Gardena, Calif.
Filed Aug. 12, 1980, Ser. No. 177,417
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—9

266,977
DEEP CASSEROLE DISH OR SIMILAR ARTICLE
George B. Jensen, deceased, late of Syracuse, N.Y., and by Stanley F. Campion, executor, Fayetteville, N.Y., assignors to Syracuse China Corporation, Syracuse, N.Y.
Filed Oct. 18, 1979, Ser. No. 85,942
The portion of the term of this patent subsequent to Jun. 9, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*01, 02*
U.S. Cl. D7—20

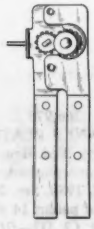




266,978
WALL MOUNTED COFFEE MAKER
Gerben Huisman, Bilthoven, Netherlands, assignor to Koninklijke Fabriek Inventum Fabriek Van Instrumenten En Elektrische Apparaten, N.V., Bilthoven, Netherlands
Filed Jun. 16, 1980, Ser. No. 159,475
Claims priority, application Netherlands, Dec. 17, 1979, 54288-00
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—309



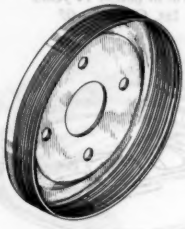
266,979
CAN OPENER
Fred S. Steiner, Woodmere, and Jay L. Austrian, Syosset, both of N.Y., assignors to Bonny Products, Inc., Hewlett, N.Y.
Filed Jul. 10, 1980, Ser. No. 168,420
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—39



266,980
COMBINATION SOLDER AND STRAND MATERIAL DISPENSER
William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265
Filed May 30, 1980, Ser. No. 154,738
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

266,981
DOOR HANDLE UNIT
Winfried Scholl, Düsseldorf, Fed. Rep. of Germany, assignor to HEWI, Heinrich Wilke GmbH, Arolsen, Fed. Rep. of Germany
Filed Aug. 7, 1979, Ser. No. 64,561
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, MR84
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—308

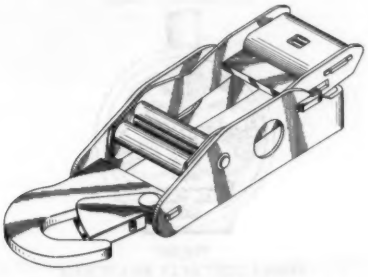
266,982
POLY-V PULLEY
Yukio Kanemitsu, Kobe, Japan, assignor to Goshi Kaisha Kanemitsu Doko Yosetsu-sho, Japan
Filed Sep. 26, 1980, Ser. No. 191,433
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D8—360



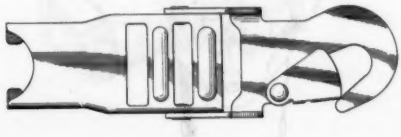
266,983
POLY-V PULLEY
Yukio Kanemitsu, Kobe, Japan, assignor to Goshi Kaisha Kanemitsu Doko Yosetsu-sho, Japan
Filed Sep. 26, 1980, Ser. No. 191,435
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D8—360

266,984
POLY-V PULLEY
Yukio Kanemitsu, Kobe, Japan, assignor to Goshi Kaisha Kanemitsu Doko Yosetsu-Sho, Japan
Filed Apr. 8, 1981, Ser. No. 252,495
Claims priority, application Japan, Dec. 26, 1980, 55-54857
Term of patent 14 years
Int. Cl. D14—*05*
U.S. Cl. D8—360

266,985
BUCKLE ASSEMBLY FOR TIGHTENING STRAP
Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.
Filed Aug. 18, 1980, Ser. No. 179,100
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—383



266,986
BUCKLE ASSEMBLY FOR TIGHTENING STRAP
Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.
Filed Aug. 18, 1980, Ser. No. 179,212
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—383



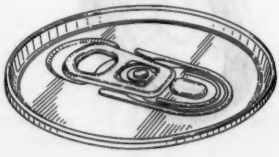
266,987
BOTTLE
Jose M. Perez Carasa y Perez de Guzman, Calle Adelfas No. 7, Urbanizacion Monte Principe, Bondilla del Monte, Madrid, Spain
Division of Ser. No. 922,165, Jul. 5, 1978. This application Jul. 30, 1980, Ser. No. 173,904
Claims priority, application Spain, Jan. 4, 1978, 91.273-A-B-C
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—300

266,988
DECANTER
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Continuation of Ser. No. 746,659, Dec. 2, 1976. This application Mar. 5, 1979, Ser. No. 17,798
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—309

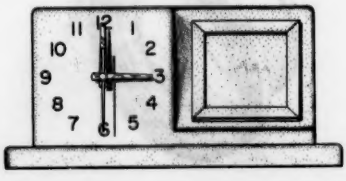
266,989
DISPLAY HOLDER FOR A CAP
Betty K. Herwood, 5440 Lindley Ave., Apt. 106, Encino, Calif. 91316
Filed Mar. 28, 1980, Ser. No. 135,133
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—311

266,990
BOTTLE
James E. Cook, Castro Valley, Calif., assignor to The J. M. Smucker Company, Orrville, Ohio
Filed Jun. 2, 1980, Ser. No. 155,202
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—389

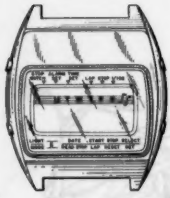
266,991
END CLOSURE FOR A CONTAINER
Gary K. Hasegawa, Chicago, and Donald R. Richardson, Palos Park, both of Ill., assignors to The Continental Group, Inc., Stamford, Conn.
Filed Aug. 22, 1979, Ser. No. 69,011
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—438



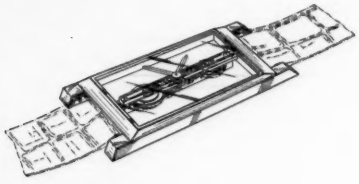
266,992
COMBINED CLOCK AND PICTURE FRAME
Clyde W. Powell, Roan Mountain, Tenn., assignor to Alpine Enterprises, Inc., Roan Mountain, Tenn.
Filed Apr. 2, 1979, Ser. No. 26,219
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



266,993
WATCH
Tetsuo Okaya, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Apr. 2, 1980, Ser. No. 136,601
Claims priority, application Japan, Oct. 3, 1979, 54-41789
Term of patent 7 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



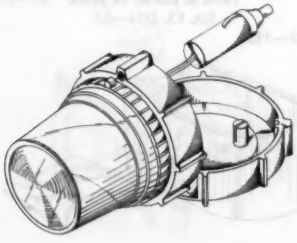
266,994
WRISTWATCH
Jean-Claude Schwab, Savagnier, and Rene Bannwart, La Chaux de Fonds, both of Switzerland, assignors to Corum, Ries, Bannwart & Co., Switzerland
Filed Apr. 21, 1980, Ser. No. 141,803
Claims priority, application Switzerland, Oct. 22, 1979, 69476
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39



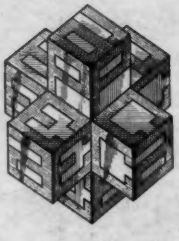
266,995
LENS METER
Toshio Nakayama, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki, Tokyo, Japan
Filed Aug. 7, 1980, Ser. No. 176,022
Claims priority, application Japan, Mar. 14, 1980, 55-9756
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

266,996
ULTRASONIC INTRUSION DETECTOR
Kenneth E. Beeson, Waltham, and H. Patrick Thornton, Acton, both of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Feb. 7, 1980, Ser. No. 119,411
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

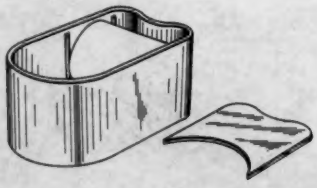
266,997
MULTI-USE ELECTRIC LIGHT
Chuang-Yun Hsue, No. 55, 4th Fl., Chih Yuan 1st Rd., Sec. 1, Pei Tou District, Taipei, Taiwan
Filed Oct. 2, 1980, Ser. No. 193,282
Term of patent 14 years
Int. Cl. D10—*06*; D26—*02, 06*
U.S. Cl. D10—114



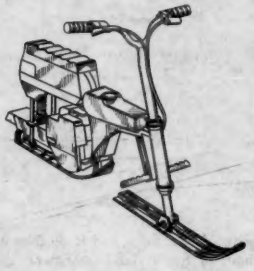
266,998
PENDANT
Umberto Vandoni, Via Bolivia, 38, Palazzolo Milanese di Paderno Dugnano, Milan, Italy
Filed Jul. 27, 1979, Ser. No. 61,444
Claims priority, application Italy, Jan. 30, 1979, 61904/79[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—61



266,999
COMBINED HYDROPONIC PLANTER, TANK AND COVER THEREFOR
Wolfgang Blaicher, Böcklinstrasse 44, 6800 Mannheim 25, Fed. Rep. of Germany
Filed Feb. 12, 1980, Ser. No. 120,858
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1979, 42 MR IV 256
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—143

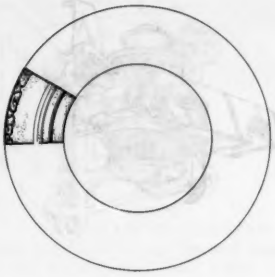


267,000
POWER DRIVEN SKI VEHICLE
Richard W. Condon, Frankfort, and Charles Stewart, Bourbonnais, both of Ill., assignors to Roper Corporation, Kankakee, Ill.
Filed Sep. 29, 1978, Ser. No. 947,249
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—7

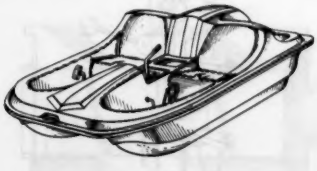


267,001
ARMORED VEHICLE
James C. LeBlanc, 38261 Long St., Mt. Clemens, Mich. 48045
Continuation of Ser. No. 927,599, Jul. 21, 1978, abandoned. This application Nov. 5, 1980, Ser. No. 204,284
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12

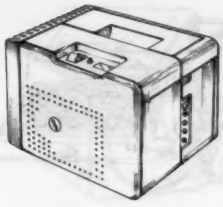
267,002
TIRE
Claude A. Hart, Sutton Coldfield, England, assignor to Dunlop Limited, London, England
Filed Dec. 4, 1979, Ser. No. 100,133
Claims priority, application United Kingdom, Jul. 5, 1979, 79990603
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151



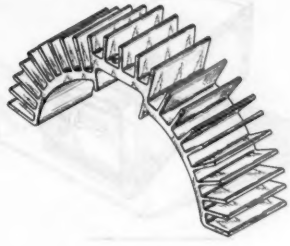
267,003
PADDLE-WHEEL WATERCRAFT
Clement Lacasse, 400, 6th St., Daveluyville, Quebec, Canada (G0Z 1C0)
Filed Jun. 23, 1980, Ser. No. 162,048
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—306



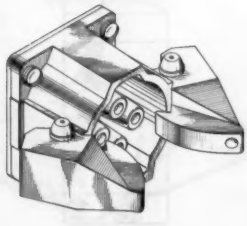
267,004
PORTABLE COMBINED D.C. POWER AND COMPRESSOR UNIT
Alberto Vitaloni, Turin, Italy, assignor to Finindustriale S.r.l. and Sicom S.r.l., both of Turin, Italy
Filed Apr. 18, 1980, Ser. No. 141,531
Claims priority, application Italy, Oct. 29, 1979, 53694/79[U]
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—11



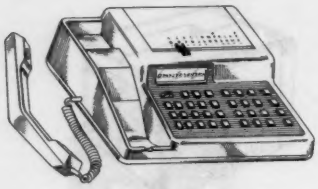
267,005
HEAT SINK FOR A FAN MOTOR CONTROL
Warren E. Dennis, Pasadena, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.
Filed Sep. 2, 1980, Ser. No. 182,849
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23



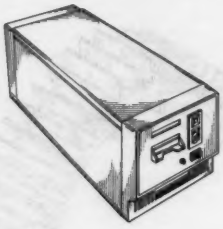
267,006
ELECTRICAL CONNECTOR
Bronius Gaizauskas, Chicago, Ill., assignor to Akzona Incorporated, Asheville, N.C.
Filed Jan. 14, 1980, Ser. No. 112,016
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



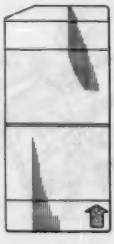
267,007
COMBINED TELEPHONE SET AND MICROPROCESSOR
Suchi Chiou, 5th Fl., No. 15, La. 180, Ho-Chiang St., Taipei, Taiwan
Filed Mar. 16, 1979, Ser. No. 21,260
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—101



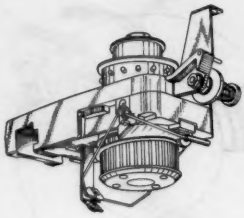
267,008
MEDIA CONVERTER UNIT FOR A MAGNETIC CARD FOR DATA PROCESSING DISPLAY SYSTEM
Claude H. Hutcheson, Garland, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 15, 1979, Ser. No. 85,178
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—107



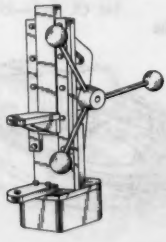
267,009
MAGNETIC CARD FOR MICROWAVE OVEN
Kelichiro Doi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 11, 1979, Ser. No. 83,842
Claims priority, application Japan, Apr. 12, 1979, 54-15216
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—117



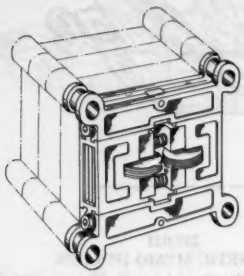
267,010
THREAD DELIVERY FEEDER FOR TEXTILE MACHINES
Kurt A. G. Jacobsson, Ulricehamn, and Lars G. Rosenblad, Brötjemark, both of Sweden, assignors to Aktiebolaget IRO, Ulricehamn, Sweden
Filed Oct. 22, 1979, Ser. No. 87,178
Claims priority, application Sweden, Apr. 25, 1979, 79-1067
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—78



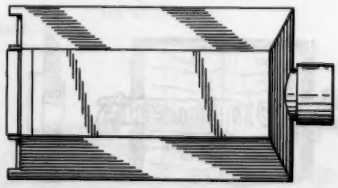
267,011
MAGNETIC DRILL STAND
Charles F. Morris, Flint, Mich., assignor to Jancy Engineering Co., Davenport, Iowa
Filed Jul. 2, 1979, Ser. No. 53,859
Term of patent 14 years
Int. Cl. D15—*09*; D8—*01*
U.S. Cl. D15—132



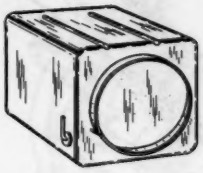
267,012
MODULAR ROLLER DIE UNIT
Keiichiro Yoshida, No. 641, Mobara, Mobara City, Chiba Prefecture 297, Japan
Filed Jul. 25, 1979, Ser. No. 60,663
Claims priority, application Japan, Mar. 16, 1979, 54-10687
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—136



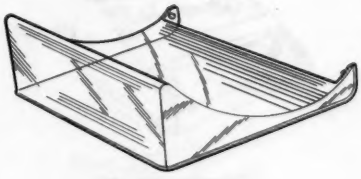
267,013
DEVELOPER POWDER CONTAINER
Richard D. Hipp, Jr., Rehseba Township, Chisago County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Sep. 30, 1980, Ser. No. 192,533
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D16—32



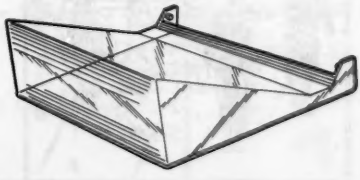
267,014
DRUM
George Migirian, 2832 E. Grand Blvd., Detroit, Mich. 48211
Filed Jan. 24, 1980, Ser. No. 114,825
The portion of the term of this patent subsequent to May 31, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22



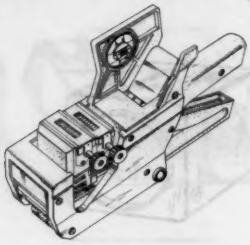
267,015
NOISE ABATEMENT COVER FOR TYPEWRITER
Raymond Clavel, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland
Filed Aug. 19, 1980, Ser. No. 180,168
Claims priority, application Switzerland, Mar. 7, 1980, 111.034
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—12



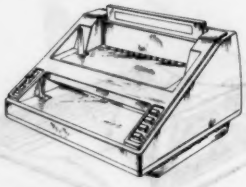
267,016
NOISE ABATEMENT COVER FOR TYPEWRITER
Raymond Clavel, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland
Filed Aug. 19, 1980, Ser. No. 180,169
Claims priority, application Switzerland, Mar. 7, 1980, 111.034/80
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—12



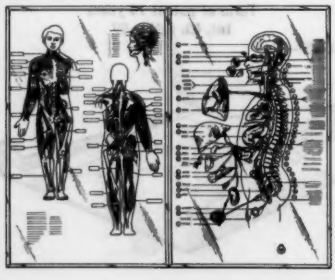
267,017
HAND OPERATED LABELING MACHINE
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan
Filed Jun. 6, 1980, Ser. No. 157,044
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—19



267,018
MACHINE FOR BINDING BOOKS
James G. Balmer, Bloomfield Hills, Mich., assignor to Velo-Bind, Inc., Sunnyvale, Calif.
Filed Apr. 3, 1980, Ser. No. 136,502
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D18—34

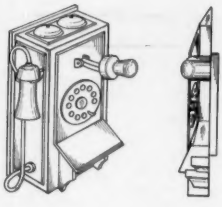


267,019
PHYSIOLOGICAL DISPLAY PANEL
Bruce Goldsmith, Kerhonkson, N.Y., assignor to Space Odyssey Ltd., Kerhonkson, N.Y.
Filed Oct. 22, 1979, Ser. No. 87,456
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

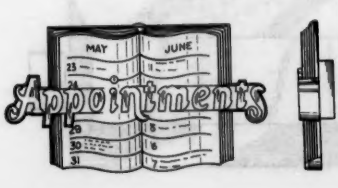


267,020
MAGNETIC MEMO HOLDER
Ruediger Einhorn, Katonah, and Lee R. Chasen, Port Chester, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Nov. 12, 1980, Ser. No. 205,956
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—91

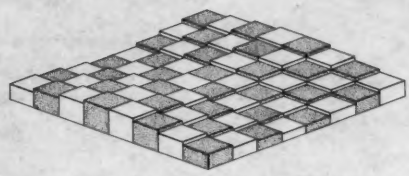
267,021
MAGNETIC MEMO HOLDER
Ruediger Einhorn, Katonah, and Lee R. Chasen, Port Chester, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Nov. 12, 1980, Ser. No. 205,958
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—91



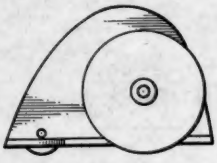
267,022
MAGNETIC MEMO HOLDER
Ruediger Einhorn, Katonah, and Lee R. Chasen, Port Chester, both of N.Y., assignors to Coats & Clark, Inc., New Rochelle, N.Y.
Filed Nov. 12, 1980, Ser. No. 206,045
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—91



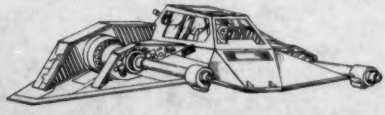
267,023
GAME BOARD
Jerome Bowser, 2003 S. 8th St., Sheboygan, Wis. 53081
Filed Nov. 4, 1980, Ser. No. 203,911
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—23



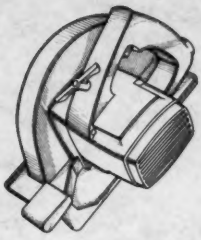
267,024
RIDING TOY
Thomas S. Brazier, 5972 Kenwick Cir., Huntington Beach, Calif. 92648
Filed Sep. 2, 1980, Ser. No. 183,411
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—71



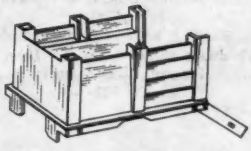
267,025
TOY SPACE VEHICLE
George W. Lucas, Jr., San Anselmo; Ralph McQuarrie, Berkeley, and Joseph E. Johnston, Fairfax, all of Calif., assignors to Lucasfilm, Ltd., San Rafael, Calif.
Filed Apr. 18, 1980, Ser. No. 141,593
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



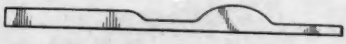
267,026
TOY SAW
John R. Wildman, North Riverside, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Aug. 31, 1979, Ser. No. 71,172
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120



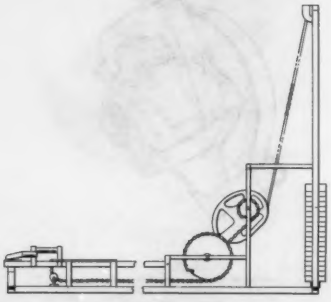
267,027
TOY TRUCK BODY
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 22, 1980, Ser. No. 114,276
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—141



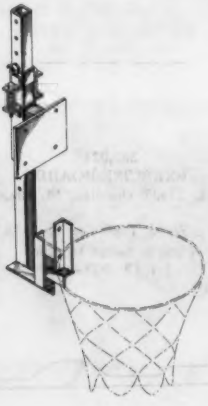
267,028
EXERCISE BOARD
Mathew V. Spisak, 27437 Ursuline, St. Clair Shores, Mich. 48081
Filed Mar. 24, 1980, Ser. No. 133,301
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191



267,029
PHYSICAL EXERCISER
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Dec. 4, 1979, Ser. No. 100,155
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



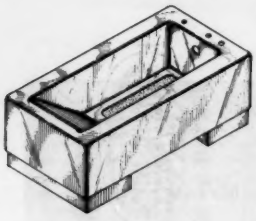
267,030
VERTICALLY ADJUSTABLE BASKETBALL GOAL SUPPORTING DEVICE FOR ATTACHMENT TO BACKBOARDS
Gerry Kringlie, Box 777, Valley City, N. Dak. 58072
Filed Oct. 10, 1980, Ser. No. 196,671
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—201



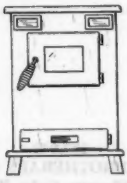
267,031
COMBINED FISHING ROD AND CANE POLE HOLDER
Billy A. Hamlin, P.O. Box 206, Mayesville, S.C. 29104
Filed Oct. 6, 1980, Ser. No. 194,322
Term of patent 7 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

267,032
WATER PURIFIER
Pierre Lafontaine, Tarbes, France, assignor to SEB, Selongey, France
Filed Mar. 24, 1980, Ser. No. 133,575
Claims priority, application France, Oct. 10, 1979, 168
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

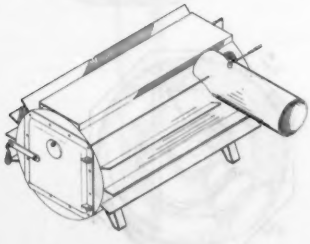
267,033
VARIABLE HEIGHT BATHTUB
Leo Koet, Vestpoort 33, Delft, Netherlands
Filed Sep. 2, 1980, Ser. No. 183,347
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—56



267,034
COAL BURNING STOVE
Richard A. Russo, Holbrook, Mass., assignor to Russo Manufacturing Corp., Randolph, Mass.
Filed Mar. 26, 1980, Ser. No. 134,191
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



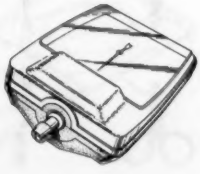
267,035
WOOD BURNING STOVE
Arvin Jinsky, Rte. 1, Patrick Rd., Beloit, Wis. 53511
Filed Dec. 12, 1980, Ser. No. 215,707
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



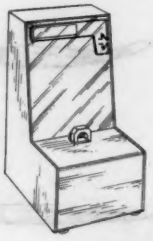
267,036
DENTAL HANDPIECE OR SIMILAR ARTICLE
Werner Podszus, Weissenohe, and Peter Schoeller, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Division of Ser. No. 49,894, Jun. 19, 1979, Pat. No. Des. 263,877. This application Jul. 6, 1981, Ser. No. 280,708
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12

267,037
DIALYZER CARTRIDGE
Kurt Spranger, Amerbuch-Entringen; Wolfgang Heck, Hechingen, both of Fed. Rep. of Germany, and Bengt A. Nestell, Bjerred, Sweden, assignors to Gambro Dialysatoren KG, Fed. Rep. of Germany
Filed Sep. 12, 1979, Ser. No. 75,157
Claims priority, application Sweden, Apr. 6, 1979, 79-0882
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—21

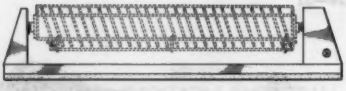
267,038
SPHYGMOMANOMETER
Shinji Koshino, Shibukawa, Japan, assignor to Nihon Seimitsu Sokki Co., Ltd., Gunma, Japan
Filed Nov. 8, 1979, Ser. No. 92,481
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21



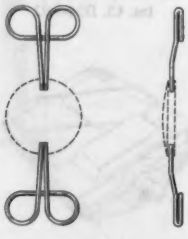
267,039
HEART RATE INDICATOR CABINET
Olav Kok, San Diego, Calif., assignor to Worldvend, Ltd., San Diego, Calif.
Filed Feb. 23, 1981, Ser. No. 236,734
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—21



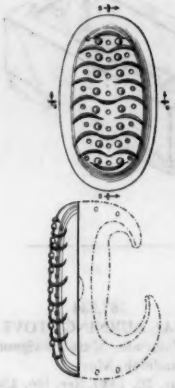
267,040
SUPPORT FOR PLATELET ROTATOR
Melvin J. David, 16221 Quemada Rd., Encino, Calif. 91314
Filed Jan. 9, 1978, Ser. No. 868,124
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—29



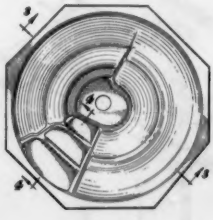
267,041
INTRAOCULAR LENS HAPTIC LOOP
Philip C. Hessburg, 1169 Three Mile Dr., Grosse Pointe Park, Mich. 48230
Filed May 5, 1980, Ser. No. 146,679
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33



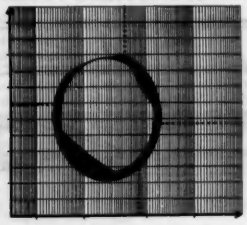
267,042
GLOVE FOR A BEAUTY MASSAGER
William Weinberger, Newton, N.J., assignor to Houbigant, Inc., Ridgefield, N.J.
Filed Sep. 19, 1979, Ser. No. 77,120
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36



267,043
HYDROTHERAPY SPA
Warren W. Kingsley, Sherman Oaks; Robert C. Kingsley, Los Angeles, and Benjamin H. Stansbury, Jr., Beverly Hills, all of Calif., assignors to Hydro Spa, Inc., Piru, Calif.
Filed Apr. 21, 1980, Ser. No. 142,450
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38

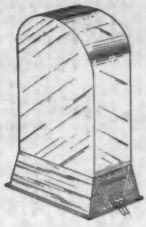


267,044
DIAGRAM FOR EVALUATION OF AMYLASE TESTS
Katarina Birath, Morkullvägen 45A, S-752 52 Uppsala, Sweden
Filed Nov. 5, 1980, Ser. No. 203,551
Claims priority, application Sweden, May 9, 1980, 80-0954
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99

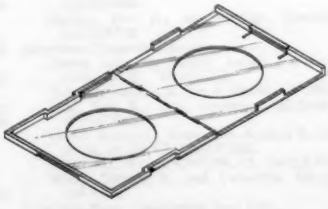


267,045
COMBINED GAME AND FLASHLIGHT
Robert Lieberman, Edina, and Peter D. Pook, Bloomington, both of Minn., assignors to Leisure Dynamics, Inc., Minneapolis, Minn.
Filed Aug. 27, 1979, Ser. No. 69,717
Term of patent 14 years
Int. Cl. D21—*01*; D26—*02*
U.S. Cl. D26—38

267,046
LAMP
Carlo S. Bessone, Woburn; William J. Roche, Merrimac, and Tadius T. Sadoski, Salem, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.
Filed Dec. 28, 1979, Ser. No. 108,184
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—104



267,047
COIN BOX
Alf Lindström, Gullvivsvägen 5, S-810 60 Söderfors, Sweden
Filed Nov. 29, 1979, Ser. No. 98,488
Claims priority, application Sweden, Jun. 1, 1979, 79-1385; Jun. 1, 1979, 79-1386
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—34



267,048

CURTAIN MATERIAL

Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland

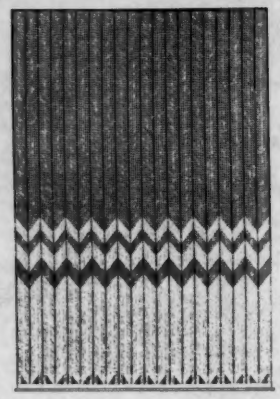
Filed May 1, 1980, Ser. No. 145,808

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1979, 1193

Term of patent 14 years

Int. Cl. D5—*05*

U.S. Cl. D47—6 E



267,049

BIRD RECEIVER FOR LIVE POULTRY MOVER

Gary L. Squier, P.O. Box 231, Gaylord, Minn. 55334

Continuation-in-part of Ser. No. 737,897, Nov. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 508,190, Sep. 23, 1974, abandoned. This application Jul. 6, 1979, Ser. No. 55,301

Term of patent 14 years

Int. Cl. D12—*05*

U.S. Cl. D34—29

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF NOVEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Arway, George W.; and Eremity, Frank, 4,360,817, Cl. 346-75.000.
Halm, James M., 4,360,584, Cl. 430-286.000.

A-T-O Inc.: *See—*
McGill, Robert W.; and Winiasz, Michael E., 4,360,101, Cl. 198-461.000.

A.T. Ramot Plastics Ltd.: *See—*
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,360,480, Cl. 260-944.000.

Abbas, Shakir A.; and Magdo, Ingrid E., to International Business Machines Corporation. Self-aligned metal process for field effect transistor integrated circuits. 4,359,816, Cl. 29-571.000.

Abblett, Timothy E.: *See—*
Sigman, Earl H.; and Abblett, Timothy E., 4,360,110, Cl. 212-159.000.

Abbott Laboratories: *See—*
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,360,668, Cl. 536-16.100.
Tadanier, John S.; Martin, Jerry R.; and Collum, Paulette, 4,360,666, Cl. 536-16.100.
Tadanier, John S.; Martin, Jerry R.; and Collum, Paulette, 4,360,667, Cl. 536-16.100.

Abbott, Thomas C., to JLG Industries. Aerial lift platform apparatus with control conduit support system. 4,360,077, Cl. 182-2.000.

Abe, Seiko: *See—*
Igashira, Toshihiko; Yoshida, Hitoshi; Nomura, Ken; and Abe, Seiko, 4,359,974, Cl. 123-52.00M.

Abet, Hans-Guenter; and Maas, Adrianus T., to NWM de Kruithoorn B.V. Process for joining a shell with a cartridge case. 4,359,925, Cl. 86-43.000.

Aciers et Outillage Peugeot: *See—*
Maret, Jean-Claude, 4,360,047, Cl. 144-117.00R.

Acker, Rolf-Dieter; Hamprecht, Gerhard; Kiehs, Karl; and Adolphi, Heinrich, to BASF Aktiengesellschaft. N-Methyl-N-silyl-carbamates and their use for combating pests. 4,360,517, Cl. 424-184.000.

Adachi, Hiromi: *See—*
Yamamoto, Seiichiro; Adachi, Hiromi; and Iwaya, Shoichi, 4,360,762, Cl. 315-101.000.

Adachi, Hiroyuki: *See—*
Saito, Takashi; Shigenobu, Michio; Kuge, Tsukasa; Sakurai, Masaaki; and Adachi, Hiroyuki, 4,359,963, Cl. 118-60.000.

Adair, James P.: *See—*
Wheeler, Lionel H.; and Adair, James P., 4,359,820, Cl. 30-97.000.

Adeboi, Frans L.: *See—*
Brokaw, Paul E.; Adeboi, Frans L.; Feimer, Bryan A.; Freeman, James G.; Kawolics, Raymond P.; and Stanbrook, Frank C., 4,360,129, Cl. 222-146.00H.

Adkison, Frank L.; and Kress, Jack L., to Oscar Mayer Foods Corporation. Meat gristle puller. 4,359,807, Cl. 17-1.00R.

Adolf Illig GmbH & Co.: *See—*
Kiefer, Gunther, 4,360,334, Cl. 425-387.100.

Adolphi, Heinrich: *See—*
Acker, Rolf-Dieter; Hamprecht, Gerhard; Kiehs, Karl; and Adolphi, Heinrich, 4,360,517, Cl. 424-184.000.

AGFA-Gevaert AG: *See—*
Zangenfeind, Helmut, 4,360,138, Cl. 226-91.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Odenwalder, Heinrich; Vetter, Hans; Janssens, Wilhelmus; and Jaeken, Jan, 4,360,581, Cl. 430-218.000.

Ahlers, Egon, to Seitz-Werke GmbH. Filling element for counterpressure filling machines. 4,360,045, Cl. 141-39.000.

Ahlstrom, Ross C., Jr.; Johnson, Mark S.; Moore, Jerry P.; and Schoppe, Ivo R., Jr., to Dow Chemical Company, The. Repetitive chromatographic apparatus. 4,359,891, Cl. 73-23.100.

Ahrens, Ernst-W., to Engelbrecht + Lemmerbrock GmbH + Co. Silage extraction apparatus. 4,360,294, Cl. 406-52.000.

Air Products and Chemicals, Inc.: *See—*
Bechara, Ibrahim S.; and Mascioli, Rocco L., 4,360,670, Cl. 544-64.000.
Pinschmidt, Robert K., Jr.; and Marten, Finn L., 4,360,632, Cl. 524-819.000.
Sheridan, John J., III; Eisenberg, Fred G.; Sandrock, Gary D.; Huston, Ernest L.; Snape, Edwin; Stickles, Raymond P.; and Cheng, Gordon C., 4,360,505, Cl. 423-248.000.

Aisan Industry Co., Ltd.: *See—*
Asai, Toshimichi, 4,360,482, Cl. 261-44.00C.

Aisin Seiki Kabushiki Kaisha: *See—*
Numazawa, Akio; Koga, Hideaki; and Suzuki, Satomi, 4,359,910, Cl. 74-476.000.

Akagawa, Masataka: *See—*
Mizuguchi, Yoshihiko; and Akagawa, Masataka, 4,360,815, Cl. 343-781.00P.

Akebono Brake Industry Co., Ltd.: *See—*
Maehara, Toshifumi, 4,360,237, Cl. 303-6.00C.

Akiba, Yuichi: *See—*
Miura, Nobuo; and Akiba, Yuichi, 4,360,558, Cl. 428-159.000.

Akiyama, Ryo; and Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Motor speed control apparatus. 4,360,767, Cl. 318-318.000.

Akiyama, Susumu: *See—*
Ohba, Masahiro; Ito, Kenzo; Akiyama, Susumu; Hirabayashi, Yuuji; Hirano, Satoshi; and Ooka, Naoto, 4,360,874, Cl. 364-431.040.

Albany International Corp.: *See—*
Campbell, Frederick S.; Trask, Elwood G.; Gasior, Walter; and Phaneuf, Roland, 4,360,554, Cl. 428-91.000.

Albee, William H. Off road vehicles with automatic inflation control system. 4,360,073, Cl. 180-74.000.

Alberts, Heinrich; Fischer, Winfried; Leuschke, Christian; and Bartl, Herbert, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions of cellulose ester graft copolymers or mixtures thereof with cellulose esters. 4,360,635, Cl. 525-54.450.

Aldinger, Fritz: *See—*
Sperner, Franz; Aldinger, Fritz; and Zwergel, Wilhelm, 4,359,977, Cl. 123-145.00A.

Allegheny Ludlum Steel Corporation: *See—*
Crytzer, Layton D., 4,360,774, Cl. 324-54.000.

Allen-Bradley Company: *See—*
Struger, Odo J.; and Brown, Ronald A., 4,360,913, Cl. 370-112.000.

Allied Corporation: *See—*
Denkewalter, Robert G.; Kolc, Jaroslav; and Lukasavage, William J., 4,360,646, Cl. 525-420.000.
Thomas, Rudy V.; Stephenson, Robert L.; and Frantom, Richard L., 4,360,225, Cl. 280-804.000.

Allis-Chalmers Corporation: *See—*
Gilmore, Thomas P., 4,360,852, Cl. 361-98.000.

Allison, George M., III, to Phillips Petroleum Company. Hot melt adhesive and additive therefor. 4,360,568, Cl. 428-411.000.

Allsop, Inc.: *See—*
Biasini, Americole R., 4,360,183, Cl. 248-451.000.

Alperstein, Martin: *See—*
Virk, Kashmir S.; and Alperstein, Martin, 4,359,862, Cl. 60-274.000.

Alpia S.A.: *See—*
Bruneau, Alain, 4,359,824, Cl. 33-438.000.

Alps Electric Co., Ltd.: *See—*
Niinuma, Akira, 4,360,721, Cl. 200-153.00J.

Alsch, Gottfried, to Naimer, Hubert Laurenz. Step switch. 4,360,719, Cl. 200-65.000.

Alsch, Gottfried, to Naimer, Hubert Laurenz. Step switch. 4,360,720, Cl. 200-65.000.

Alsup, J. Douglas, Jr.; and Jenkins, Arden F., to Syntex (U.S.A.) Inc. Reversible cam lock assembly. 4,360,281, Cl. 403-4.000.

Aluminum Company of America: *See—*
Sachtleben, Sandra G.; and Kirkland, John R., 4,360,539, Cl. 427-8.000.

AM International, Inc.: *See—*
Wolfrum, Larry M.; and Barrett, Frederick C., 4,360,840, Cl. 358-261.000.

Amano Pharmaceutical Co., Ltd.: *See—*
Yamada, Hideaki; Shimizu, Sakayu; Tani, Yoshiki; and Yamashita, Kanzo, 4,360,591, Cl. 435-4.000.

Amble, Jay S. Dynamic rebound-resonance suppression. 4,360,088, Cl. 188-380.000.

AMCA International Corporation: *See—*
Brewer, Bruce L.; and Weingart, Brooks E., 4,360,112, Cl. 212-206.000.
Brewer, Bruce L.; and Weingart, Brooks E., 4,360,304, Cl. 414-191.000.
Sigman, Earl H.; and Abblett, Timothy E., 4,360,110, Cl. 212-159.000.

American Cyanamid Company: *See—*
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,360,680, Cl. 548-362.000.
Floyd, Middleton B., Jr., 4,360,688, Cl. 556-441.000.
Lim, Sim K.; and Goodman, Richard M., 4,360,425, Cl. 209-167.000.
Meyer, Walter E.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,360,466, Cl. 549-442.000.
Richmond, Henry, 4,360,696, Cl. 564-206.000.
Wang, Samuel S.; and Lewellyn, Morris E., 4,360,615, Cl. 524-9.000.

American Heart Association, Inc.: *See—*
Hon, David, 4,360,345, Cl. 434-262.000.

American Hospital Supply Corporation: *See—*
Choksi, Pradip V., 4,360,018, Cl. 128-205.120.

AMF Incorporated: *See—*
Garofalo, Giovanni, 4,359,999, Cl. 124-80.000.
AMP Incorporated: *See—*
Davis, Newton G.; Leiby, Douglas J.; and Long, Alden O., Jr., 4,360,400, Cl. 156-468.000.
Forney, Edgar W., Jr.; and Hogendobler, Richard S., 4,360,244, Cl. 339-177.00R.
Ampex Corporation: *See—*
Ryan, John O., 4,360,747, Cl. 307-511.000.
AMSTED Industries Incorporated: *See—*
Mahlke, David J., 4,359,913, Cl. 74-579.00E.
Anderberg, Thorild N. K. E.: *See—*
Mellovist, Allan; and Anderberg, Thorild N. K. E., 4,359,969, Cl. 123-1.00A.
Andersen, Alan J.: *See—*
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,360,555, Cl. 428-107.000.
Anderson, Arthur I., to North American Car Corporation. Combination gravity/pneumatic hopper bottom. 4,360,295, Cl. 406-75.000.
Anderson, David E.: *See—*
Hagan, John D.; Swanson, Larry; and Anderson, David E., 4,360,041, Cl. 138-89.000.
Anderson, Robert L., to Fischel, Halbert. Proportioning pumping system for dialysis machines. 4,360,323, Cl. 417-349.000.
Ando, Takashi: *See—*
Oka, Naoki; Tanaka, Nobuo; and Ando, Takashi, 4,360,422, Cl. 209-5.000.
Andreades, Sam; Beske, Grant A.; and Lott, John W., to Du Pont de Nemours, E. I., and Company. Use of photosensitive stratum to create through-hole connections in circuit boards. 4,360,570, Cl. 428-596.000.
Andrews, Edward W.; and Williams, Eugene C., to General Electric Company. Digital erase of raster lines. 4,360,805, Cl. 340-744.000.
Andrews, Richard C., to Becton Dickinson and Company. Wearing apparel and methods for the manufacturing of wearing apparel. 4,359,783, Cl. 2-161.00R.
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Senter, Robert; and Andrich, Millard, 4,360,178, Cl. 248-74.00R.
Andros Incorporated: *See—*
Portner, Peer M.; and Jassawalla, Jal S., 4,360,019, Cl. 128-213.00R.
Anthony Manufacturing Corp.: *See—*
Kendall, Giles A., 4,360,037, Cl. 137-242.000.
Anzon America, Inc.: *See—*
Huang, Joseph M. G.; Capwell, Robert J.; and De Sesa, Michael A., 4,360,624, Cl. 524-411.000.
Applied Plastics Co., Inc.: *See—*
Firth, Francis G., 4,360,456, Cl. 523-456.000.
Argus Chemical Corporation: *See—*
Loeffler, Otto E.; Jain, Nirmal S.; and Kauder, Otto S., 4,360,542, Cl. 427-75.000.
Arman S.p.A.: *See—*
Maiocco, Guiseppe, 4,360,717, Cl. 200-11.00C.
Armbruster, Gerhard: *See—*
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Armond, Joseph A.: *See—*
Schergen, Mark; and Armond, Joseph A., 4,360,854, Cl. 361-149.000.
Armstrong, Donald E., to GTE Products Corporation. Package means for photoflash unit. 4,360,103, Cl. 206-482.000.
Arnold, Frank, Jr.; and Geiger, Dana F., to Kollmorgen Technologies Corporation. Fan with integral disc-shaped drive. 4,360,751, Cl. 310-60.00R.
Artura, Carmine J.: *See—*
Thayer, William J., III; and Artura, Carmine J., 4,360,923, Cl. 372-89.000.
Arway, George W.; and Eremity, Frank, to A. B. Dick Company. Low evaporation ink catcher for ink jet printing system. 4,360,817, Cl. 346-75.000.
Asada, Koichi: *See—*
Yamamura, Takamasa; Mori, Seiji; Asada, Koichi; Shinoda, Kenichi; and Higo, Yuichi, 4,360,391, Cl. 148-12.00E.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Mimura, Akio; Takahashi, Yasuyuki; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,360,594, Cl. 435-108.000.
Taguchi, Tadashi; Fujikawa, Noboru; Kohno, Mitsuo; Yoshitake, Katsumi; and Satake, Kunio, 4,360,582, Cl. 430-260.000.
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Kawasaki, Masahiro, 4,360,255, Cl. 354-23.00D.
Kurei, Hiroshi, 4,360,257, Cl. 354-36.000.
Asai, Mitsuko: *See—*
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Asai, Toshimichi, to Aisan Industry Co., Ltd. Air-fuel ratio controller of variable-venturi type carburetor. 4,360,482, Cl. 261-44.00C.
Asai, Toshio; Ohta, Toshiro; Shimizu, Kunio; and Nakazawa, Tetsuji, to Sony Corporation. Operating mode change-over apparatus in tape recording and/or reproducing apparatus. 4,360,846, Cl. 360-137.000.
Asakura, Hiroshi; Chimura, Ippei; Taguchi, Teruaki; and Minagawa, Renzo, to Toyo Kagaku Kabushiki Kaisha. Composite packing film and packing bag made of the same. 4,360,550, Cl. 428-35.000.
Asano, Kiro; Tamura, Humio; Tanaka, Hiromitsu; and Enomoto, Satoru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Steroid hormone-antitumor derivatives. 4,360,663, Cl. 536-5.000.
Asano, Masaharu; Tamura, Hideyuki; and Furuhashi, Shoji, to Nissan Motor Company, Limited. Method of controlling fuel supply to internal combustion engine. 4,359,992, Cl. 123-480.000.
ASEA Aktiebolag: *See—*
Asplund, Gunnar, 4,360,864, Cl. 363-68.000.
Stjerna, Sven, 4,360,084, Cl. 188-242.000.
Asics Corporation: *See—*
Inohara, Masanobu, 4,359,830, Cl. 36-29.000.
Askov, Alan R.; and Butler, L. Dennis, to Sperry Corporation. Hydraulic hose slack adjustor apparatus. 4,360,302, Cl. 414-24.500.
Asperger, Robert G., to Phillips Petroleum Company. Selective scale formation. 4,360,547, Cl. 427-435.000.
Asplund, Gunnar, to ASEA Aktiebolag. Voltage divider for a thyristor valve control circuit. 4,360,864, Cl. 363-68.000.
Asztalos, Stefan, to Linde Aktiengesellschaft. Valve control of an adsorption process. 4,360,362, Cl. 55-21.000.
Ataka, Saburo: *See—*
Tsukada, Toshihisa; Maruyama, Eiichi; Baji, Toru; Ataka, Saburo; Imamura, Yoshinori; Sasano, Akira; Kubo, Masaharu; Koike, Norio; and Nagahara, Shusaku, 4,360,821, Cl. 357-31.000.
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Baseggio, Marcello; and Frund, Louis, 4,359,881, Cl. 66-149.00R.
Ato, Junichi. Porous nozzle for molten metal vessel. 4,360,190, Cl. 266-220.000.
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Auding, Rudolf: *See—*
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Aug. Winkhaus: *See—*
Heiland, Bernd, 4,360,803, Cl. 340-542.000.
Automation Systems, Inc.: *See—*
Bartlett, Peter G., 4,360,784, Cl. 330-9.000.
Ayres, Ronald L., to PPG Industries, Inc. Apparatus for and method of pressing plastic sheets. 4,360,483, Cl. 264-2.700.
Azimov, Alexandr A.: *See—*
Silka, Adolf N.; Minasov, Alexandr N.; Kulakov, Nikolai K.; Likhogub, Evgeny P.; Dorfman, Gersh A.; Azimov, Alexandr A.; Davydenko, Vladimir M.; Marapulets, Gennady N.; Shestakov, Valentin A.; and Gromov, Nikolai F., 4,360,403, Cl. 202-263.000.
B. F. Goodrich Company, The: *See—*
Dinbergs, Kornelius, 4,360,651, Cl. 526-88.000.
Nehmey, Samuel D.; and Summers, James W., 4,360,602, Cl. 521-95.000.
Wootton, Gerald V.; Lane, Parley C., Jr.; and Yi, Kong S., 4,360,629, Cl. 524-553.000.
Babcock & Wilcox Company, The: *See—*
Ziels, Burton D., 4,359,800, Cl. 15-316.00R.
Babicz, Michael; Campisi, Carl; and Josephs, Joseph E., to Zenith Radio Corporation. Means and method for mounting cathode ray picture tubes. 4,360,838, Cl. 358-248.000.
Bacha, Donald J.: *See—*
Harvey, Donald W.; and Bacha, Donald J., 4,360,729, Cl. 250-227.000.
Bacon, C. Richard: *See—*
Tinsley, William B.; and Bacon, C. Richard, 4,360,186, Cl. 251-1.00B.
Bailey, John M., to Caterpillar Tractor Co. Burn-out type cleaning means for particulate filter of engine exhaust system. 4,359,864, Cl. 60-311.000.
Bailly, Jean C.: *See—*
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Baker, Edward G.: *See—*
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Baker, Philip G.; and Matthews, Gerald L., to Polaroid Corporation. Variable magnification slide copy camera. 4,360,264, Cl. 355-40.000.
Baker, Robert G.: *See—*
Hill, Alfred; and Baker, Robert G., 4,360,208, Cl. 277-153.000.
Baldwin, David L.: *See—*
Bickel, Gary W.; and Baldwin, David L., 4,360,248, Cl. 350-96.160.
Baldwin, Ronald M.; Lin, Tz-Hong; and Winchell, Harry S., to Medi-Physics, Inc. Amines useful as brain imaging agents. 4,360,511, Cl. 424-1.500.
Baldwin, Wilbur A.; and Silverman, Richard, to Roto Form Sales Corp. Feed chute for electronic components. 4,360,095, Cl. 193-40.000.
Balitz, David M.; Bush, James A.; O'Herron, Frances A.; and Nettleton, Donald E., Jr., to Bristol-Myers Company. Fermentation process for producing anandimycin. 4,360,595, Cl. 435-119.000.
Ballantyne, Jack R.: *See—*
Cantwell, Thomas C., Jr.; Wilmot, Richard D.; and Ballantyne, Jack R., 4,360,811, Cl. 343-7.00A.
Balz, Werner: *See—*
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Barber-Colman Company: *See*—
Fransson, George E.; Johnson, Stuart J.; and Haug, Edward J., 4,360,296, Cl. 409-17.000.

Barbier, Jean Y.; and Moran, Christopher J. Cranial insertion of surgical needle utilizing computer-assisted tomography. 4,360,028, Cl. 128-659.000.

Barham, Peter J.; and Selwood, Alan, to Imperial Chemical Industries Limited. Removal of solvent from gels of poly(hydroxybutyrate) and shaped articles formed therefrom. 4,360,488, Cl. 264-210.100.

Barkan, Edward: *See*—
Swartz, Jerome; Harrison, Shelley A.; Barkan, Edward; Delfine, Frank; and Brown, George, 4,360,798, Cl. 340-146.3AG.

Barlett, Harry. Mouthpiece for resuscitation. 4,360,017, Cl. 128-202.280.

Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., to International Telephone and Telegraph Corporation. Luminaire for residential roadway lighting. 4,360,863, Cl. 362-346.000.

Baron, Kenneth L.: *See*—
Biehl, Roy J.; and Baron, Kenneth L., 4,360,201, Cl. 273-73.00C.

Barrett, Frederick C.: *See*—
Wolfrum, Larry M.; and Barrett, Frederick C., 4,360,840, Cl. 358-261.000.

Barrows, Thomas H., to Minnesota Mining and Manufacturing Company. Polymeric acid contraceptive devices. 4,360,013, Cl. 128-130.000.

Bartels, James I., to Honeywell Inc. Single probe low water control. 4,360,738, Cl. 307-118.000.

Barth, Charles F.; Stelson, Thomas S.; and Blake, David E., to TRW Inc. Grinding wheel wear detection and dressing method. 4,359,841, Cl. 51-325.000.

Bartl, Herbert: *See*—
Alberts, Heinrich; Fischer, Winfried; Leuschke, Christian; and Bartl, Herbert, 4,360,635, Cl. 525-54.450.

Bartlett, Peter G., to Automation Systems, Inc. Transformer coupled isolation amplifier. 4,360,784, Cl. 330-9.000.

Bartman, Benjamin, to Rohm and Haas Company. Pressure sensitive hot melt adhesive. 4,360,638, Cl. 524-286.000.

Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., to Orcon Corporation. Fill strand transfer process for making non woven fabrics. 4,360,555, Cl. 428-107.000.

Baseggio, Marcello; and Frund, Louis, to Atelier de Construction Steiger S.A. Drawing device for a straight knitting machine. 4,359,881, Cl. 66-149.00R.

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Acker, Rolf-Dieter; Hamprecht, Gerhard; Kiehs, Karl; and Adolphi, Heinrich, 4,360,517, Cl. 424-184.000.
Blanck, Klaus; Dethlefsen, Winfried; Jungbauer, Anton; Leutner, Bernd; Schier, Ernst-Juergen; Schlimper, Hans-Ulrich; and Schneehage, Hans H., 4,360,504, Cl. 423-236.000.
Buschmann, Ernst; Schirmer, Ulrich; Zeeh, Bernd; Sauter, Hubert; and Jung, Johann, 4,360,465, Cl. 548-568.000.
Fuchs, Hugo; Frommer, Elmar; and Grosskinsky, Otto-Alfred, 4,360,461, Cl. 260-239.30A.
Kummer, Rudolf; and Schneider, Heinz-Walter, 4,360,692, Cl. 560-175.000.
Lindenschmidt, Gerhard; Schulte, Wolfgang; Brandstetter, Franz; Naarmann, Herbert; and Penzien, Klaus, 4,360,455, Cl. 252-609.000.
Magnussen, Peter; Schumacher, Volker; Gebert, Wolfgang; Reitz, Heinrich; and Praetorius, Werner, 4,360,695, Cl. 562-590.000.
Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; and Schlag, Johannes, 4,360,644, Cl. 525-390.000.
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,360,672, Cl. 544-240.000.
Schmidt, Wolfram; Paust, Joachim; and Nurrenbach, Axel, 4,360,669, Cl. 260-207.500.
Steck, Werner; Roller, Hermann; Sarnecki, Wilhelm; and Balz, Werner, 4,360,377, Cl. 75-0.5AA.
Zeeh, Bernd; Pommer, Ernst-Heinrich; and Buschmann, Ernst, 4,360,526, Cl. 424-269.000.

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Cuddy, William A.; Thir, Basil; and Eisenstein, Stephen E., 4,360,144, Cl. 228-180.00R.
Schmolka, Irving R., 4,360,451, Cl. 252-316.000.

Batcho, Andrew D.; Uskokovic, Milan R.; and Wovkulich, Peter M., to Hoffmann-La Roche Inc. Process and intermediates for the synthesis of Vitamin D_3 metabolites and chenodeoxycholic acid. 4,360,470, Cl. 260-397.100.

Bate, Robert T., to Texas Instruments Incorporated. Non-volatile semiconductor memory elements. 4,360,900, Cl. 365-184.000.

Bates, Merle R. Tool for shearing off rivet mounted sickle teeth. 4,360,136, Cl. 225-103.000.

Bates, Thomas R.; Bonner, Richard B.; and Clark, Ronald K., to Shell Oil Company. Method for making measurements of the chemical swelling effect of a fluid on a shale. 4,359,901, Cl. 73-153.000.

Bauder, Armin: *See*—
Kromer, Gunter; Bauder, Armin; and Maurhoff, Gerhard, 4,359,990, Cl. 123-453.000.

Bauer, Gunter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Target arrangement for spallation-neutron-sources. 4,360,495, Cl. 376-151.000.

Bauer, Peter-Josef, to Robert Bosch GmbH. Washing arrangement for windows of power vehicles. 4,360,158, Cl. 239-284.00R.

Bauman, Albert J. ESR Based portable microanalytic apparatus and method. 4,360,776, Cl. 324-316.000.

Bax, Hanns-Jorg: *See*—
Horlbeck, Gernot; Heuer, Horst; Bax, Hanns-Jorg; and Jadamus, Hans, 4,360,661, Cl. 528-272.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bellamy, David; and Quick, John L., 4,360,435, Cl. 210-636.000.
Chiknas, Steven G., 4,360,360, Cl. 23-230.00R.
Hitchcock, James R., Jr.; and Nevens, Charles J., 4,360,020, Cl. 128-269.000.

Bayer Aktiengesellschaft: *See*—
Alberts, Heinrich; Fischer, Winfried; Leuschke, Christian; and Bartl, Herbert, 4,360,635, Cl. 525-54.450.
Findeisen, Kurt; Kratzer, Hans; and Lenthe, Manfred, 4,360,479, Cl. 260-545.00R.
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,360,690, Cl. 560-57.000.
Grogler, Gerhard; Rasshofer, Werner; and Kopp, Richard, 4,360,603, Cl. 521-159.000.
Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,360,528, Cl. 424-269.000.
Klenk, Herbert; Wirthwein, Rolf; Waldmann, Helmut; and Seifert, Hermann, 4,360,682, Cl. 549-266.000.
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,360,529, Cl. 424-269.000.
Lindner, Christian; Liebig, Lothar; and Ott, Karl-Heinz, 4,360,620, Cl. 524-234.000.
Meyer, Horst; Franckowiak, Gerhard; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,360,520, Cl. 424-250.000.
Zabrocki, Karl; and Schaupp, Kurt, 4,360,452, Cl. 252-356.000.

BBC Brown, Boveri & Company, Limited: *See*—
Pohl, Herbert, 4,360,750, Cl. 310-54.000.
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Beard, Harold J.: *See*—
Fletcher, Laird C.; Beard, Harold J.; and O'Blasny, Richard, 4,360,420, Cl. 208-184.000.

Beasley, J. Donald, to Gould Inc. Evanescent fiber optic pressure sensor apparatus. 4,360,247, Cl. 350-96.150.

Beaucamp, Klaus; Nelboeck, Michael; Gauhl, Helmgard; Seidel, Hans; Gruber, Wolfgang; and Brunner, Herwig, to Boehringer Mannheim GmbH. Process for the preparation of cholesterol esterase. 4,360,596, Cl. 435-197.000.

Beccalori, Ferruccio; Corvi, Gianguido; Merli, Giovanni; Tamburoni, Giancarlo; and Tamburoni, Lorenzo. Apparatus for the reduction of big cylindrical bales of hay, straw and the like and for the distribution thereof. 4,360,167, Cl. 241-101.00A.

Bechara, Ibrahim S.; and Mascioli, Rocco L., to Air Products and Chemicals, Inc. Amino and amido dialkyl tin carboxylates. 4,360,670, Cl. 544-64.000.

Bechtiger, Charles G.; and Miller, James C., to Sargent & Greenleaf, Inc. Time delay combination lock. 4,359,883, Cl. 70-269.000.

Becker, Waldemar: *See*—
Stumpp, Gerhard; Walz, Ludwig; Schielinsky, Gerhard; Wessel, Wolf; Kuttner, Thomas; Flaig, Ulrich; Piwonka, Fridolin; Eisele, Hermann; Boehringer, Andreas; Kubach, Hans; Locher, Johannes; and Becker, Waldemar, 4,359,991, Cl. 123-478.000.

Becker, Werner: *See*—
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Beckman Instruments, Inc.: *See*—
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Ishimaru, Kenzo; and Nielsen, Steven T., 4,360,150, Cl. 233-26.000.
Lee, Robert T. Y., 4,360,413, Cl. 204-180.00G.

Beckman, John A.; Rinehart, Ronald A.; and Hammond, Dennis L., to Dana Corporation. Method for manufacturing suspension members. 4,360,143, Cl. 228-155.000.

Beckmann, Klaus, to Gewerkschaft Eisenhutte Westfalia. Conveying apparatus for use in mineral mining. 4,360,102, Cl. 198-729.000.

Becton Dickinson and Company: *See*—
Andrews, Richard C., 4,359,783, Cl. 2-161.00R.

Beeley, Michael G., to De Lorean Manufacturing Company. Reversibly powered rotary snow tiller. 4,359,831, Cl. 37-258.000.

Beer, Heinz, to Syma Intercontinental AG. Coupling element for supports having an undercut longitudinal groove. 4,360,286, Cl. 403-201.000.

Beers, Lionel W. Independent, load-seeking, preloaded, vehicle suspension. 4,360,220, Cl. 280-677.000.

Behnke, Robert W. Automated, door-to-door, demand-responsive public transportation system. 4,360,875, Cl. 364-436.000.

Behrenz, Wolfgang: *See*—
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,360,690, Cl. 560-57.000.

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Beilis, Aron. Key plate and hook assembly. 4,359,887, Cl. 70-456.00B.

Beinvogl, Willy, to Siemens Aktiengesellschaft. Method of producing structures comprised of layers consisting of silicides or silicide-polysilicon by reactive sputter etching. 4,360,414, Cl. 204-192.00E.

Belart, Juan, to ITT Industries, Inc. Spot-type disc brake. 4,360,079, Cl. 188-73.340.

Bell, Allyn R.: *See*—
Doweyko, Arthur M. P.; Regis, Richard R.; and Bell, Allyn R., 4,360,677, Cl. 546-294.000.

Bell Telephone Laboratories, Incorporated: *See*—
Bobeck, Andrew H.; and North, James C., 4,360,893, Cl. 365-36.000.
Freyman, Ronald L., 4,360,742, Cl. 307-224.00C.
Geary, John M., 4,360,894, Cl. 365-117.000.
Gonda, Joseph, 4,360,867, Cl. 363-158.000.

Bellamy, David; and Quick, John L., to Baxter Travenol Laboratories, Inc. Process for sterilizing and transferring a solution. 4,360,435, Cl. 210-636.000.

Bellicardi, Francesco; Zucchi, Giorgio; and Giusberti, Roberto, to Weber Carburatori Azienda della Weber S.p.A. Electromagnetically actuated fuel injection valve for internal combustion engines. 4,360,164, Cl. 239-585.000.

Bellus, Daniel: *See*—
Martin, Pierre; and Bellus, Daniel, 4,360,676, Cl. 546-243.000.

Beloit Corporation: *See*—
Grenlund, Wesley F., 4,360,771, Cl. 320-61.000.
Johnson, Richard E., 4,359,964, Cl. 118-63.000.

Ben-Dror, Jonathan: *See*—
Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, 4,359,878, Cl. 62-476.000.

Bendix Corporation, The: *See*—
Claxton, William B.; Casey, Gary L.; Blatter, Albert; and Miller, John A., 4,360,161, Cl. 239-463.000.
Normann, Richard W.; and Fairbairn, Leroy W., 4,360,185, Cl. 249-175.000.
Sano, Frank M.; Golden, Edward J.; and Sliwa, Robert A., 4,359,926, Cl. 89-1.814.

Beretta, Pier C., to Fabbrica D'Armi P. Beretta S.p.A. Multipositioned two-legged support for portable automatic weapons. 4,359,834, Cl. 42-94.000.

Berger, Joel G.; and Tahbaz, Pirouz, to Schering Corporation. 5 Phenyl-1,3-alkano-1,2,3,4,4a,9b-hexahydropyrido [4,3-b]indoles. 4,360,673, Cl. 546-70.000.

Bergman, Robert G.: *See*—
Kaplan, Leonard; and Bergman, Robert G., 4,360,600, Cl. 518-700.000.

Bergwerksverband GmbH: *See*—
Schulz, Rolf C.; and Engel, Dieter, 4,360,639, Cl. 525-289.000.

Berlin, Joseph B.; and Skilton, James B., to Boeing Company, The. Backlash free shear joint. 4,359,880, Cl. 464-33.000.

Bernal AG: *See*—
Mosberger, Clemens, 4,360,301, Cl. 411-57.000.

Bernauer, Karl; and Pfoertner, Karlheinz, to Hoffmann-La Roche Inc. 5-[p-(Substituted)phenyl]-2,2-dialkyl-4-phenyl-3-oxazoline. 4,360,530, Cl. 424-272.000.

Berneke, Erik S., to V. Kann Rasmussen Holding A/S. Window sash hinge. 4,359,805, Cl. 16-364.000.

Bernstein, Seymour: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,360,680, Cl. 548-362.000.

Beske, Grant A.: *See*—
Andreades, Sam; Beske, Grant A.; and Lott, John W., 4,360,570, Cl. 428-596.000.

Bhattacharya, Ashok K.: *See*—
Spencer, John E.; and Bhattacharya, Ashok K., 4,360,756, Cl. 313-179.000.

Bian, Donald J. Mitt and target for catching a ball. 4,360,206, Cl. 273-344.000.

Biasini, Americole R., to Allsop, Inc. Retaining device for sheet music. 4,360,183, Cl. 248-451.000.

Bibb, Mervyn J.; and Hopwood, David A., to National Research Development Corporation. Streptomyces plasmid and culture. 4,360,597, Cl. 435-253.000.

Bickel, Gary W.; and Baldwin, David L., to International Telephone and Telegraph Corporation. Multiport optical communication system and optical star structure therefor. 4,360,248, Cl. 350-96.160.

Bicron Corporation: *See*—
Novak, William P.; Toepke, Ival; and White, John, 4,360,733, Cl. 250-361.00R.

Biehl, Roy J.; and Baron, Kenneth L., to Biehl, Roy J. Racquetball or tennis racquet. 4,360,201, Cl. 273-73.00C.

Biersack, Horst, to Cornes & Co. OHG, Firma. Motor-driven shredding apparatus particularly for garden waste. 4,360,166, Cl. 241-92.000.

Billault, Georges: *See*—
Runavot, Yves; Billault, Georges; and Salvetat, Jacques, 4,360,628, Cl. 524-508.000.

Bir, Roger; and Schermann, Jean-Pierre, to Commissariat a l'Energie Atomique. Method of isotope separation. 4,360,501, Cl. 423-3.000.

Birkle, Siegfried: *See*—
Stoeger, Klaus; Birkle, Siegfried; and Gehring, Johann, 4,360,409, Cl. 204-14.00N.

Bishop, Thomas D., to Deritend Engineering Co. Ltd., The. Machine for the treatment of web material. 4,360,354, Cl. 493-22.000.

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Fitzsimmons, George W.; Lund, Walter W., Jr.; and Nalos, Ervin J., 4,360,741, Cl. 307-151.000.
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Bradley, John J., to Paper Converting Machine Company. Web unit handling method and apparatus. 4,360,194, Cl. 270-51.000.
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Brauner, Arne H., to Brauner, Arne H. Semi-domed paperboard food carton. 4,360,147, Cl. 229-33.000.
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Brems, John H. Precision registry with lift and carry transfer system. 4,360,097, Cl. 198-345.000.
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Breslow, Donald H., to Itek Corporation. Encoder alignment method and apparatus. 4,360,730, Cl. 250-231.0SE.
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Bridges, Thomas N., Sr., to Lockheed Corporation. Sealant applicator. 4,359,965, Cl. 118-711.000.
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Okado, Yosuke; Kawamura, Masanori; and Tomioka, Takashi, 4,360,627, Cl. 524-496.000.
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Kaplan, Murray A.; Bouzard, Daniel; Perol, Claude; Stemer, Jacques; and Weber, Abraham, 4,360,523, Cl. 424-257.000.
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Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,360,458, Cl. 260-112.50R.
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Gray, Alan, 4,360,401, Cl. 156-665.000.
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Farrington, Frederick; and Clough, Peter S., 4,360,508, Cl. 423-544.000.
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Brodowski, John, to United States of America, Energy. Electrostatic quadrupole array for focusing parallel beams of charged particles. 4,360,760, Cl. 315-5.410.
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Brokaw, Paul E.; Adeboi, Frans L.; Feimer, Bryan A.; Freeman, James G.; Kawolics, Raymond P.; and Stanbrook, Frank C., to Meyer Dairy Products Company, The. System for dispensing viscous or chunky materials. 4,360,129, Cl. 222-146.00H.
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Brown, George: *See*—
Swartz, Jerome; Harrison, Shelley A.; Barkan, Edward; Delfine, Frank; and Brown, George, 4,360,798, Cl. 340-146.3AG.
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Browning, James A., 4,360,062, Cl. 166-299.000.
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Brunswick Corporation: *See*—
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Bruot, Roger C.: *See*—
Langston, Earl M.; Moore, Charles W.; Malecki, Richard L.; and Bruot, Roger C., 4,360,877, Cl. 364-465.000.
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Burgess, Dennis A.; and Rebers, Kenneth D. Diazo developing apparatus. 4,360,259, Cl. 354-299.000.
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Daniel, Vernon T.; Robbins, Edward J.; and Wang, Kenneth Y., 4,360,277, Cl. 374-137.000.
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Burroughs Wellcome Co.: *See*—
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Burton, James A., to Hydril Company. Roll-flex connector. 4,360,226, Cl. 285-223.000.
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Goedemans, Wilhelmus T., 4,360,509, Cl. 424-1.000.
C. Keller GmbH und Co, KG: *See*—
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Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., 4,360,448, Cl. 252-309.000.
Calkins, Noel C. Thermostatically controlled valve. 4,359,972, Cl. 123-41.080.
Call, Lloyd S. Attachment for adding weights to scale beam. 4,360,072, Cl. 177-247.000.
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Cameron, Richard J.: *See*—
Rhodes, John D.; and Cameron, Richard J., 4,360,793, Cl. 333-212.000.
Cammarano, Armando S.; and DiGiacomo, Giulio, to International Business Machines Corporation. Pin for brazing to a substrate and improved package resulting therefrom. 4,360,289, Cl. 403-272.000.
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Canter, Nathan H.; Robbins, Max L.; and Baker, Edward G., to Exxon Research and Engineering Co. Oil recovery process using polymer microemulsion complexes. 4,360,061, Cl. 166-274.000.
Cantwell, Thomas C., Jr.; Wilmot, Richard D.; and Ballantyne, Jack R., to Hughes Aircraft Company. Adaptive zero mean system for controlling noise false alarm rate. 4,360,811, Cl. 343-7.00A.
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Casino, Alan A. Animal litter device. 4,359,966, Cl. 119-1.000.
Casperson, John R., to Phillips Petroleum Company. Feedstock nozzle and use in carbon black reactor. 4,360,497, Cl. 422-156.000.
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Castellucci, Nicholas T.; Grunewalder, John F.; and Ostrowski, John S., to PPG Industries Inc. Base solubilization of an azole-functional resin and electrodeposition of such solubilized resin. 4,360,614, Cl. 523-421.000.
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Girault, Herve; Reymond, Jean C.; and Cauzan, Pierre, 4,360,876, Cl. 364-449.000.
Celanese Corporation: *See*—
Costanza, John R.; and Collins, George, 4,360,541, Cl. 427-54.100.
Reger, Arie; and Sprague, B. Sheldon, 4,360,417, Cl. 204-290.00R.
Shimp, David A., 4,360,613, Cl. 523-416.000.
Williams, Albert G., 4,360,662, Cl. 528-499.000.
Chalberg, Philip E. Suction outlet assembly for whirlpool baths and the like. 4,359,790, Cl. 4-541.000.
Chamberlain John Deere Pty. Ltd.: *See*—
Witzel, Homer D., 4,359,854, Cl. 56-228.000.
Champion International Corporation: *See*—
Roccaforte, Harry I., 4,360,107, Cl. 206-626.000.
Wilcox, John F., 4,360,145, Cl. 229-1.50R.
Chaney, David B.: *See*—
Koncelik, Joseph A.; Chaney, David B.; and Lockard, Walter G., 4,360,240, Cl. 312-238.000.
Chapman, Leonard T. Compact hoisting device. 4,360,187, Cl. 254-8.00R.
Chapman, Richard A.; Lewis, Adam J., Jr.; Hynecek, Jaroslav; and Kinch, Michael A., to Texas Instruments Incorporated. Infrared charge transfer device (CTD) system. 4,360,732, Cl. 250-332.000.
Chaput, Guy J.; and Sich, Edward M., to Northern Telecom Limited. Telephone circuit. 4,360,710, Cl. 179-81.00R.
Chemische Werke Huels AG: *See*—
Horibeck, Gernot; Heuer, Horst; Bax, Hanns-Jorg; and Jadamus, Hans, 4,360,661, Cl. 528-272.000.
Chemo-Sero-Therapeutic Research Institute, The: *See*—
Ono, Syoji; Fukumoto, Yuji; and Yoshida, Tsunemasa, 4,360,457, Cl. 260-112.00B.

Chen, Edward: *See*—
Thornton, William A., Jr.; Larson, Daniel A.; and Chen, Edward, 4,360,758, Cl. 313-227.000.

Cheng, Gordon C.: *See*—
Sheridan, John J., III; Eisenberg, Fred G.; Sandrock, Gary D.; Huston, Ernest L.; Snape, Edwin; Stickles, Raymond P.; and Cheng, Gordon C., 4,360,505, Cl. 423-248.000.

Chevron Research Company: *See*—
Loken, Tor; and Bryhn, Odd R., 4,360,599, Cl. 501-147.000.
Miller, Stephen J., 4,360,419, Cl. 208-111.000.

Chiknas, Steven G., to Baxter Travenol Laboratories, Inc. Centrifugal analyzer. 4,360,360, Cl. 23-230.00R.

Child, James L., Jr.: *See*—
Fouss, James L.; Parker, John J.; Child, James L., Jr.; and Sting, Donald W., 4,360,042, Cl. 138-119.000.

Childers, Thomas W., to Exxon Production Research Co. Hydraulic actuator. 4,359,932, Cl. 92-31.000.

Chimura, Ippei: *See*—
Asakura, Hiroshi; Chimura, Ippei; Taguchi, Teruaki; and Minagawa, Renzo, 4,360,550, Cl. 428-35.000.

Chiyomaru, Isao: *See*—
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,360,375, Cl. 71-88.000.

Chloride Group Public Limited Company: *See*—
Ray, William F.; and Davis, Rex M., 4,360,770, Cl. 318-701.000.

Chloride Silent Power Limited: *See*—
Brennan, Michael P. J., 4,360,575, Cl. 429-104.000.

Choate, James R. Log-burning stove. 4,360,002, Cl. 126-190.000.

Choksi, Pradip V., to American Hospital Supply Corporation. Anesthesia system and method of filtering respiratory gas. 4,360,018, Cl. 128-205.120.

Chong, Joshua A., to Rohm and Haas Company. Radiation curable compositions containing cyanoalkoxyalkyl and cyanothiaalkylalkyl acrylates. 4,360,540, Cl. 427-44.000.

Christ, Klaus H.: *See*—
Neumann, Karl-Heinz; Hagenlocher, Walter; Kleebaur, Karl; and Christ, Klaus H., 4,360,749, Cl. 310-42.000.

Christiansen, Thorbjorn N. Apparatus for detaching fishes from fish-hooks on a fishing line. 4,359,835, Cl. 43-6.500.

Christie, Christopher E.: *See*—
Brown, Jack E., Jr.; Christie, Christopher E.; Forney, Joseph M.; and Underwood, Richard M., 4,359,896, Cl. 73-146.000.

Christini, James N.: *See*—
Boyer, Carl W.; Christini, James N.; and Vogt, Martin C., 4,360,503, Cl. 423-54.000.

Chromalloy American Corporation: *See*—
Schaaf, Wayne J.; and Boswell, Bennie J., 4,360,067, Cl. 172-413.000.

Chua, David L.; Garoutte, Kurt F.; and Levy, Louis L., to Honeywell, Inc. Electrochemical cell. 4,360,572, Cl. 429-53.000.

Ciba-Geigy AG: *See*—
Hurter, Rudolf, 4,360,460, Cl. 260-156.000.
Mehl, Wolfgang, 4,360,357, Cl. 8-471.000.
Postle, Stephen R., 4,360,588, Cl. 430-512.000.
Tomka, Ivan, 4,360,590, Cl. 430-642.000.

Ciba-Geigy Corporation: *See*—
Haug, Theobald, 4,360,655, Cl. 528-120.000.
Martin, Pierre; and Bellus, Daniel, 4,360,676, Cl. 546-243.000.
Meyer, Hans R.; and Weber, Kurt, 4,360,679, Cl. 548-327.000.
Muller, Helmut; and Schwarzenbach, Kurt, 4,360,617, Cl. 524-101.000.
Nikles, Erwin, 4,360,675, Cl. 546-216.000.

Ciccone, Joseph L.: *See*—
Bloomer, Milton D.; Ciccone, Joseph L.; Harnden, John D., Jr.; Kornrumpf, William P.; and Shattuck, Donald P., 4,360,847, Cl. 361-3.000.

Citelli, Charles, to Musacchia, John. Gas turbine. 4,359,861, Cl. 60-39.150.

Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas L., to Medtronic, Inc. Apparatus for monitoring and storing a variety of heart activity signals. 4,360,030, Cl. 128-702.000.

Clark, Ronald K.: *See*—
Bates, Thomas R.; Bonner, Richard B.; and Clark, Ronald K., 4,359,901, Cl. 73-153.000.

Clark, Steven D.: *See*—
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., 4,360,288, Cl. 403-268.000.

Claxton, William B.; Casey, Gary L.; Blatter, Albert; and Miller, John A., to Bendix Corporation, The. Electromagnetic fuel injector. 4,360,161, Cl. 239-463.000.

Claycomb, Jackson R., to Dresser Industries, Inc. Weight on drill bit measuring apparatus. 4,359,899, Cl. 73-151.000.

Clements Corp.: *See*—
Wolters, Clemens A., 4,359,970, Cl. 123-23.000.

Clough, Peter S.: *See*—
Farrington, Frederick; and Clough, Peter S., 4,360,508, Cl. 423-344.000.

Coelus, Gaspar, to Societe Anonyme France-Atlas. Apparatus for testing the load-bearing properties of a foundation. 4,359,890, Cl. 73-12.000.

Colgate-Palmolive Company: *See*—
Stima, Joseph F., 4,360,021, Cl. 128-287.000.

Collgon, Pierre, to Valeo. Hollowed plate for a heat exchanger with fluid flow tubes. 4,360,060, Cl. 165-173.000.

Collins, George: *See*—
Costanza, John R.; and Collins, George, 4,360,541, Cl. 427-54.100.

Collins, Jesse P. Rail joint bar bolt nut locking assembly. 4,360,154, Cl. 238-262.000.

Collins, Marvin K.; and Blatter, Kenneth F., to Dresser Industries, Inc. Liquid distributor for a wet electrostatic precipitator. 4,360,366, Cl. 55-119.000.

Collins, Roy S., to Triman Limited. Studs for footwear and method of making same. 4,360,490, Cl. 264-249.000.

Collum, Paulette: *See*—
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,360,668, Cl. 536-16.100.
Tadanier, John S.; Martin, Jerry R.; and Collum, Paulette, 4,360,666, Cl. 536-16.100.
Tadanier, John S.; Martin, Jerry R.; and Collum, Paulette, 4,360,667, Cl. 536-16.100.

Colpitts, Ralph, to Polythetics, Inc. Composite denture combining soft polyurethane and hard polymer components. 4,360,344, Cl. 433-199.000.

Combustion Engineering, Inc.: *See*—
Blaskowski, Henry J., 4,360,339, Cl. 432-58.000.
Ferrin, Charles R.; and Manning, William P., 4,360,363, Cl. 55-73.000.
Moore, Richard F., 4,359,949, Cl. 110-171.000.

Commissariat a l'Energie Atomique: *See*—
Bir, Roger; and Schermann, Jean-Pierre, 4,360,501, Cl. 423-3.000.
Mauduit, Daniel; and Sauron, Georges, 4,360,775, Cl. 324-210.000.

Communications Satellite Corporation: *See*—
Horna, Otakar A., 4,360,712, Cl. 179-170.200.

Comparetto, John E.; and Brand, Robert L. Inverted vortex, particle separation chamber. 4,360,428, Cl. 210-188.000.

Conair, Inc.: *See*—
Peterson, Russell I., Jr., 4,360,168, Cl. 241-294.000.

Conard, Albert F. Low voltage switching circuit for controlling a high voltage electrical load. 4,360,740, Cl. 307-134.000.

Confalone, Pasquale N.; Pizzolato, Giacomo; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Novel thiophene compounds. 4,360,681, Cl. 549-68.000.

Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 9-(Hydroxy, lower alkoxy or lower alkanoyloxy)-2-(1H-tetrazol-5-yl)naphtho-(2,1-b)-pyran-1-ones and anti-allergic use thereof. 4,360,527, Cl. 424-269.000.

Conoco Inc.: *See*—
Durr, Albert M., Jr., 4,360,443, Cl. 252-76.000.
Oberlander, Richard K.; and Decker, Lewis B., Jr., 4,360,449, Cl. 252-313.00R.
Oehler, Dorothy Z., 4,360,359, Cl. 23-230.0EP.

Container Corporation of America: *See*—
Helms, Charles R., 4,360,121, Cl. 220-270.000.

Continental Group, Inc., The: *See*—
Klootwyk, Ronald I., 4,360,577, Cl. 429-209.000.

Cope, James R. Line winding device for fishing reels. 4,360,172, Cl. 242-129.800.

Copeland, Terry M.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Process for extraction of fluorinated copolymers with fluorocarbons. 4,360,601, Cl. 521-27.000.

Copp, Carl A., Jr.; Pandzik, Richard T.; and Gaines, Marvin E., to General Motors Corporation. Multicylinder refrigerant compressor muffler arrangement. 4,360,321, Cl. 417-269.000.

Corazzelli, Frank G., Jr. Laryngoscope. 4,360,008, Cl. 128-11.000.

Cordey, Jacque R., to Synthes AG. Device and method for inserting a bone screw. 4,359,906, Cl. 73-862.230.

Cornelson, Stanley L. Farrowing house. 4,359,967, Cl. 119-16.000.

Corner, Gary W.; and Jorgenson, Gary W., to International Business Machines Corporation. High current acceleration servomotor driver. 4,360,768, Cl. 318-389.000.

Cornes & Co. OHG, Firma: *See*—
Biersack, Horst, 4,360,166, Cl. 241-92.000.

Cornet, Jean, to Thomson-CSF. Permanent memory structure with thermo-optical writing and optical reading and writing process in such a structure. 4,360,895, Cl. 365-127.000.

Corning Glass Works: *See*—
Blankenship, Michael G.; Keck, Donald B.; and Sarkar, Arnab, 4,360,371, Cl. 65-3.120.
Borrelli, Nicholas F.; Morse, David L.; and Schreurs, Jan W. H., 4,360,441, Cl. 252-62.590.
Brezinski, Donald P., 4,360,415, Cl. 204-195.00F.
Guillevic, Gildas J. M., 4,360,567, Cl. 428-410.000.

Corvetto, Andres A. Gas compressor of the rotating type. 4,360,318, Cl. 417-68.000.

Corvi, Gianguido: *See*—
Beccalori, Ferruccio; Corvi, Gianguido; Merli, Giovanni; Tamburoni, Giancarlo; and Tamburoni, Lorenzo, 4,360,167, Cl. 241-101.00A.

Corzine, Robert G., to United States of America, Navy. Phased array of six log-periodic dipoles. 4,360,816, Cl. 343-792.500.

Costanza, John R.; and Collins, George, to Celanese Corporation. Radiation cured microvoid coatings. 4,360,541, Cl. 427-54.100.

Cove, Harry R.; and Muchow, John D., to Smith International Inc. Multiple orifice valves. 4,360,040, Cl. 137-625.300.

Cowell, Mark J.; and Sharples, Thomas D., to Beckman Instruments, Inc. Aerosol resistant bowl rotor. 4,360,151, Cl. 233-27.000.

Coyne, Gerard G., to General Electric Company. Heat pump coil circuit. 4,359,877, Cl. 62-278.000.

Craemer, Robert H.; and Scardapane, Anthony N., to Molins Machine Company, Inc. Glue machine automatic rider roll. 4,360,538, Cl. 427-8.000.

Craft, Andrew C.; and Hill, Robert H., to Delta Cube, Inc. Tension bar for chain link fence. 4,360,188, Cl. 256-47.000.
Cranberg, Alexis M.; and Dysarz, Edward D. Subsea foundation. 4,360,291, Cl. 405-205.000.
Crawford, Gary W.: *See*—
Pearson, Norman A.; and Crawford, Gary W., 4,360,424, Cl. 209-44.000.
Cretex Companies, Inc., The: *See*—
Hagan, John D.; Swanson, Larry; and Anderson, David E., 4,360,041, Cl. 138-89.000.
Cribbs, Robert W.: *See*—
Engle, Gary L.; and Cribbs, Robert W., 4,359,904, Cl. 73-620.000.
Crum, Gerald W.: *See*—
Kostas, Evans; Crum, Gerald W.; and Walker, Jerome F., 4,360,886, Cl. 364-551.000.
Crutzen, Serge; Dal Cero, Joseph; and Denis, Rene, to European Atomic Energy Community (EURATOM). System for the identification of objects, for example nuclear fuel elements. 4,359,903, Cl. 73-602.000.
Crytzer, Layton D., to Allegheny Ludlum Steel Corporation. Apparatus for measuring the surface insulation characteristics of coatings on magnetic materials. 4,360,774, Cl. 324-54.000.
CTS Corporation: *See*—
Joseph, Joel R.; and Bleeke, William F., 4,360,707, Cl. 179-1.00A.
Cubranich, Ladislaw D.: *See*—
Branigin, Michael H.; Cubranich, Ladislaw D.; and Henderson, Edward E., 4,360,891, Cl. 364-900.000.
Cuddy, William A.; Thir, Basil; and Eisenstein, Stephen E., to BASF Wyandotte Corporation. Printed circuit board soldering. 4,360,144, Cl. 228-180.00R.
Culver, William H.: *See*—
Schmadel, Donald; Culver, William H.; and Gould, Gordon, 4,360,272, Cl. 356-352.000.
Curwen, Peter, to Mechanical Technology Incorporated. Suspension and vibration isolation system for a linear reciprocating machine. 4,360,087, Cl. 188-379.000.
Cushing, David E.: *See*—
Stanley, Philip E.; Cushing, David E.; and Taylor, Donald R., 4,360,869, Cl. 364-200.000.
Cvetovich, Raymond J.; Melillo, David G.; Ryan, Kenneth M.; and Sletzinger, Meyer, to Merck & Co., Inc. Process for the preparation of (2S)-tetrahydro-2α-methyl-6-oxo-4β-amino-2H-pyran-3α-carboxylic acid. 4,360,684, Cl. 549-291.000.
Cyin, Maxwell U. D. Noodle machine. 4,360,332, Cl. 425-191.000.
D. Gottlieb & Co.: *See*—
Garbark, Roman F., 4,360,203, Cl. 273-121.00A.
D. H. Haden Limited: *See*—
Haden, Denis H., 4,360,726, Cl. 219-441.000.
D. W. Zimmerman Mfg., Inc.: *See*—
Owen, Douglas B., 4,360,320, Cl. 417-244.000.
Dadea, Giovanni M.: *See*—
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,360,439, Cl. 252-61.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Takeuchi, Satoshi, 4,360,266, Cl. 355-91.000.
Daisel Kagaku Kogyo Kabushikikaisha: *See*—
Usami, Akira; Kotani, Motoharu; and Goda, Tomoko, 4,360,022, Cl. 128-290.00R.
Dal Cero, Joseph: *See*—
Crutzen, Serge; Dal Cero, Joseph; and Denis, Rene, 4,359,903, Cl. 73-602.000.
Dale, Clara M. Crib. 4,359,792, Cl. 5-100.000.
Dalencon, Claude, to Thomson-CSF. Process for varnishing a card equipped with connecting pins and card obtained in this way. 4,360,559, Cl. 428-174.000.
Dana Corporation: *See*—
Beckman, John A.; Rinehart, Ronald A.; and Hammond, Dennis L., 4,360,143, Cl. 228-155.000.
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, to Rhone-Poulenc Industries. Binder for manufacturing nonwovens. 4,360,561, Cl. 428-288.000.
Daniel, Vernon T.; Robbins, Edward J.; and Wang, Kenneth Y., to Burlington Industries, Inc. Portable fabric temperature profiler. 4,360,277, Cl. 374-137.000.
Daniels, Phillip D. Deck apparatus. 4,359,851, Cl. 52-298.000.
Danielsson, Allan: *See*—
Lindblom, Karl-Peter C.; and Danielsson, Allan, 4,360,759, Cl. 313-381.000.
Darling, Donald F.; and Dicks, Eric, to Lever Brothers Company. Artificial cream composition and method of preparation. 4,360,535, Cl. 426-570.000.
Darnell, William R.: *See*—
Jackson, Winston J., Jr.; and Darnell, William R., 4,360,648, Cl. 525-462.000.
Darome, Inc.: *See*—
Braun, Daryl, 4,360,827, Cl. 358-85.000.
Data General Corporation: *See*—
Retter, Charles T., 4,360,868, Cl. 364-200.000.
Dauvergne, Hector A. Low profile portable power plant. 4,359,951, Cl. 110-234.000.
Davidson, Craig R.; and Sedlak, John M., to General Electric Company. Anode catalysts for electrolysis of brine. 4,360,416, Cl. 204-266.000.
Davidson, Donald H.: *See*—
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,360,234, Cl. 299-5.000.
Davila, Efrain A.: *See*—
Davila, Jose E.; Davila, Efrain A.; and Gomez, Jim H., 4,360,034, Cl. 133-3.00D.
Davila, Jose E.; Davila, Efrain A.; and Gomez, Jim H., to Gianotti, Joseph C., Trustee. Coin sorter-counter. 4,360,034, Cl. 133-3.00D.
Davis, Kenneth. Diamond drill bits. 4,360,069, Cl. 175-393.000.
Davis, Newton G.; Leiby, Douglas J.; and Long, Alden O., Jr., to AMP Incorporated. Apparatus for binding conductors in a harness. 4,360,400, Cl. 156-468.000.
Davis, Rex M.: *See*—
Ray, William F.; and Davis, Rex M., 4,360,770, Cl. 318-701.000.
Davydenko, Vladimir M.: *See*—
Silka, Adolf N.; Minasov, Alexandr N.; Kulakov, Nikolai K.; Likhogub, Evgeny P.; Dorfman, Gersh A.; Azimov, Alexandr A.; Davydenko, Vladimir M.; Marapulets, Gennady N.; Shestakov, Valentin A.; and Gromov, Nikolai F., 4,360,403, Cl. 202-263.000.
DBM Industries Limited: *See*—
Perrella, Guido; and Thompson, William E., 4,360,054, Cl. 164-269.000.
De Lorean Manufacturing Company: *See*—
Beeley, Michael G., 4,359,831, Cl. 37-258.000.
Debaise, Michel J., to Hainaut-Sambre S.A. Apparatus for pouring molten steel. 4,360,133, Cl. 222-590.000.
Decker, Lewis B., Jr.: *See*—
Oberlander, Richard K.; and Decker, Lewis B., Jr., 4,360,449, Cl. 252-313.00R.
Degussa Aktiengesellschaft: *See*—
Kleemann, Axel; Nygren, Robert; and Wagner, Rudolf, 4,360,697, Cl. 564-475.000.
Nauroth, Peter; Kuhlmann, Robert; Turk, Gunther; Bode, Rudolf; and Reisert, Arthur, 4,360,388, Cl. 106-288.00B.
Deich, Grigory B.: *See*—
Pegov, Vadim B.; Deich, Grigory B.; Dvorkin, Solomon Y.; and Ukholov, Konstantin V., 4,359,916, Cl. 82-1.00C.
Delamare, Guy R., to Institut Francais du Petrole. Device for mooring a floating installation to an anchored offshore installation. 4,359,959, Cl. 114-230.000.
Delavan Corporation: *See*—
Soth, J. Michael; and Pack, Roy E., Jr., 4,360,156, Cl. 239-11.000.
Delfine, Frank: *See*—
Swartz, Jerome; Harrison, Shelley A.; Barkan, Edward; Delfine, Frank; and Brown, George, 4,360,798, Cl. 340-146.3AG.
Dellinger, Eugene L. Orthodontic method for treating malocclusion. 4,360,341, Cl. 433-24.000.
Delta Central Refining, Inc.: *See*—
Fletcher, Laird C.; Beard, Harold J.; and O'Blasny, Richard, 4,360,420, Cl. 208-184.000.
Delta Cube, Inc.: *See*—
Craft, Andrew C.; and Hill, Robert H., 4,360,188, Cl. 256-47.000.
Delta Electronics Mfg. Corp.: *See*—
Nikitas, Nick C., 4,360,245, Cl. 339-218.00R.
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., to Wisconsin Alumni Research Foundation. 23-Dehydro-25-hydroxyvitamin D_3. 4,360,471, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., to Wisconsin Alumni Research Foundation. Trihydroxyvitamin D_3 compounds. 4,360,472, Cl. 260-397.200.
DeMarco, Michael, to United States of America, Navy. Underwater vehicle porting system. 4,360,348, Cl. 440-67.000.
Denis, Rene: *See*—
Crutzen, Serge; Dal Cero, Joseph; and Denis, Rene, 4,359,903, Cl. 73-602.000.
Denkewalter, Robert G.; Kolc, Jaroslav; and Lukasavage, William J., to Allied Corporation. Preparation of lysine based macromolecular highly branched homogeneous compound. 4,360,646, Cl. 525-420.000.
Dennis, Kent S.: *See*—
Reineke, Charles E.; and Dennis, Kent S., 4,360,609, Cl. 523-179.000.
Deritend Engineering Co. Ltd., The: *See*—
Bishop, Thomas D., 4,360,354, Cl. 493-22.000.
De Sesa, Michael A.: *See*—
Huang, Joseph M. G.; Capwell, Robert J.; and De Sesa, Michael A., 4,360,624, Cl. 524-411.000.
Desvignes, Bernard; Bailly, Jean C.; and Mangin, Pierre, to Naphtachimie Societe Anonyme. Process for the production of copolymers of propylene and but-1-ene, products resulting therefrom and uses thereof. 4,360,650, Cl. 526-60.000.
Dethlefsen, Winfried: *See*—
Blanck, Klaus; Dethlefsen, Winfried; Jungbauer, Anton; Leutner, Bernd; Schier, Ernst-Juergen; Schlimper, Hans-Ulrich; and Schneehage, Hans H., 4,360,504, Cl. 423-236.000.
Deutsche Gold- und Silberscheideanstalt vormals Roessler: *See*—
Klenk, Herbert; Wirthwein, Rolf; Waldmann, Helmut; and Seifert, Hermann, 4,360,682, Cl. 549-266.000.
DiBiasi, Daniel J.; and Krutchen, Charles M., to Mobil Oil Corporation. Process for introducing an additive material to polymeric foams. 4,360,486, Cl. 264-37.000.
Dickman, John E.; and Donley, William B., to General Motors Corporation. Method for making late programmable read-only memory devices. 4,359,817, Cl. 29-571.000.
Dicks, Eric: *See*—
Darling, Donald F.; and Dicks, Eric, 4,360,535, Cl. 426-570.000.
Diesel Kiki Company, Ltd.: *See*—
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Diesel Kiki Kabushiki Kaisha: *See*—
Kubota, Yutaka; and Sugimoto, Hitoshi, 4,360,765, Cl. 315-209.00M.
Dietl, Hans K.; and Young, Howard S., to Eastman Kodak Company. Preparation of quinones by salcomine-catalyzed oxidation of phenols. 4,360,469, Cl. 260-396.00R.
Dietz, Kurt; and Friedel, Rudolf, to Siemens Aktiengesellschaft. Method and apparatus for the operation of rotary anode X-ray tubes. 4,360,734, Cl. 378-93.000.
DiGiacomo, Giulio: *See*—
Cammarano, Armando S.; and DiGiacomo, Giulio, 4,360,289, Cl. 403-272.000.
Dijkshoorn, Willem: *See*—
Keuning, Roelof; Haighton, Adolf J.; Dijkshoorn, Willem; and Huizinga, Hindrik, 4,360,536, Cl. 426-603.000.
Dillman, Thomas P., to Sherwood Corporation, The. Lawn umbrella. 4,360,035, Cl. 135-20.00R.
Dimyan, Magid Y.; and Castro, Carlos A., to Texas Instruments Incorporated. Magnetic domain random access memory. 4,360,899, Cl. 365-171.000.
Dinbergs, Kornelius, to B. F. Goodrich Company, The. Process for preparing spherical and porous vinyl resin particles. 4,360,651, Cl. 526-88.000.
Dingwall, James A.: *See*—
Wilson, Raymond L.; and Dingwall, James A., 4,360,887, Cl. 364-552.000.
Diversified Air Products, Inc.: *See*—
Wright, Neal A., 4,359,879, Cl. 62-513.000.
Dr. Beck & Co. AG: *See*—
JanBen, Harald; and Hansch, Ferdinand, 4,360,543, Cl. 427-120.000.
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Fels, Werner, 4,359,941, Cl. 101-415.100.
Peters, Hans-Werner; and Weiss, Klaus, 4,360,340, Cl. 432-59.000.
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Dolza, John. Split engine control system. 4,359,979, Cl. 123-198.00F.
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Ahlstrom, Ross C., Jr.; Johnson, Mark S.; Moore, Jerry P.; and Schoppe, Ivo R., Jr., 4,359,891, Cl. 73-23.100.
Brady, Thomas P.; and Langer, Horst G., 4,360,474, Cl. 260-429.500.
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Hefner, Robert E., Jr., 4,360,647, Cl. 525-445.000.
Johnston, Howard, 4,360,524, Cl. 424-263.000.
Nelson, Donald L., 4,360,634, Cl. 525-36.000.
Reierson, Robert L., 4,360,407, Cl. 203-34.000.
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Marko, Ollie W., 4,360,687, Cl. 556-440.000.
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Down, Stanley L. Wood burning stove. 4,360,000, Cl. 126-77.000.
Downs, Michael J.; and Raine, Kenneth W., to National Research Development Corporation. Interferometer systems. 4,360,271, Cl. 356-351.000.
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Claycomb, Jackson R., 4,359,899, Cl. 73-151.000.
Collins, Marvin K.; and Blatter, Kenneth F., 4,360,366, Cl. 55-119.000.
Garney, Tom A., 4,359,900, Cl. 73-151.000.
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Stype, Robert D., 4,360,365, Cl. 55-119.000.
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Ducret, Lucien C. Quick clamping device to hold BX cables. 4,359,819, Cl. 30-90.300.
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Duncan, James P.; and Lawson, James L. Quench press. 4,360,189, Cl. 266-118.000.
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Andreades, Sam; Beske, Grant A.; and Lott, John W., 4,360,570, Cl. 428-596.000.
Copeland, Terry M.; and Resnick, Paul R., 4,360,601, Cl. 521-27.000.
Krespan, Carl G.; and King, Alicia P., 4,360,645, Cl. 525-403.000.
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Dynascan Corporation: *See*—
Goldstein, Richard, 4,360,739, Cl. 307-132.00E.
Dysarz, Edward D.: *See*—
Cranberg, Alexis M.; and Dysarz, Edward D., 4,360,291, Cl. 405-205.000.
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Haslanger, Martin F.; and Sprague, Peter W., 4,360,685, Cl. 549-386.000.
Sundeen, Joseph E., 4,360,532, Cl. 424-283.000.
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Jackson, Winston J., Jr.; and Darnell, William R., 4,360,648, Cl. 525-462.000.
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Shepherd, Stanley H., 4,360,336, Cl. 431-12.000.
Eden, J. Gary, to United States of America, Navy. Laser bottlenecking technique. 4,360,924, Cl. 372-91.000.
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Fitzgerald, James J., 4,360,861, Cl. 362-211.000.
Edward Wilson & Son Limited: *See*—
Wilson, Raymond L.; and Dingwall, James A., 4,360,887, Cl. 364-552.000.
Edwards, David J.: *See*—
Bond, Richard G.; and Edwards, David J., 4,360,086, Cl. 188-343.000.
Edwards, John V., to Kingsdown Medical Consultants, Ltd. Catheter retainer. 4,360,025, Cl. 604-180.000.
Eeckhout, Roger V., to SCM Corporation. Overtemperature protector for an electrically heated appliance. 4,360,725, Cl. 219-253.000.
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Stumpp, Gerhard; Walz, Ludwig; Schielinsky, Gerhard; Wessel, Wolf; Kuttner, Thomas; Flaig, Ulrich; Piwonka, Fridolin; Eisele, Hermann; Boehringer, Andreas; Kubach, Hans; Locher, Johannes; and Becker, Waldemar, 4,359,991, Cl. 123-478.000.

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Cuddy, William A.; Thir, Basil; and Eisenstein, Stephen E., 4,360,144, Cl. 228-180.00R.

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Jamison, Thomas D.; and Radcliff, Frank T., 4,360,715, Cl. 191-12.20R.

Electro-Matic Products Co.: *See*—
Schergen, Mark; and Armond, Joseph A., 4,360,854, Cl. 361-149.000.

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Klose, Peter; and Ovshinsky, Herbert, 4,360,579, Cl. 430-8.000.
Lewis, Gary, 4,360,265, Cl. 355-43.000.

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Schulz, Rolf C.; and Engel, Dieter, 4,360,639, Cl. 525-289.000.

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Engler, Edward M.; Kaufman, Frank B.; Kramer, Steven R.; and Scott, Bruce A., to International Business Machines Corporation. High resolution video storage disk. 4,360,583, Cl. 430-270.000.

English, John A., to Green-Gard Associates. Golf flag stick holder. 4,360,200, Cl. 273-34.00R.

Enomoto, Satoru: *See*—
Asano, Kiro; Tamura, Humio; Tanaka, Hiromitsu; and Enomoto, Satoru, 4,360,663, Cl. 536-5.000.

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Reyner, Ellis M., 4,360,131, Cl. 222-386.500.

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Arway, George W.; and Eremity, Frank, 4,360,817, Cl. 346-75.000.

Erickson, Jerroll C. Drafting machine attachment. 4,359,825, Cl. 33-438.000.

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Erps, Floyd D.; and Fried, Raymond L., to John Fluke Mfg. Co., Inc. Phase-locked loop frequency synthesizer. 4,360,788, Cl. 331-1.00A.

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Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, 4,359,878, Cl. 62-476.000.

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Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, 4,360,605, Cl. 523-116.000.

Esterl, Robert; and Weiser, Josef, to Siemens Aktiengesellschaft. Getter body. 4,360,444, Cl. 252-181.100.

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Pellenc, Roger J. P., 4,359,821, Cl. 30-228.000.

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Wright, William E., 4,360,699, Cl. 568-635.000.

Eubanks, Kenneth B.; and Loeb, Clifford E., to General Motors Corporation. Non-welded steering wheel and method of manufacture. 4,359,911, Cl. 74-552.000.

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Crutzen, Serge; Dal Cero, Joseph; and Denis, Rene, 4,359,903, Cl. 73-602.000.

Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., to General Electric Company. Textured surface polypropylene film. 4,360,552, Cl. 428-36.000.

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Evans, Thomas W.: *See*—
Breck, Judy A.; and Evans, Thomas W., 4,360,836, Cl. 358-245.000.

Evans, Walter R.; Murphree, Gary R.; and Osborne, Shelly M., to Sargent & Greenleaf, Inc. Key lock cylinder for possibly contaminated environments. 4,359,886, Cl. 70-366.000.

EVG Entwicklungs-und Verwertungs Gesellschaft m.b.H: *See*—
Ritter, Klaus; Scherr, Rudolf; Ritter, Gerhard; and Ritter, Josef, 4,360,724, Cl. 219-58.000.

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Childers, Thomas W., 4,359,932, Cl. 92-31.000.
O'Connor, John A., III; Holland, Warren E.; Burley, James D.; Rogers, Ronald D.; Watkins, Fred E.; and Terral, Ben D., 4,360,064, Cl. 166-319.000.

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Canter, Nathan H.; Robbins, Max L.; and Baker, Edward G., 4,360,061, Cl. 166-274.000.
Feng, Tom; and Ghosh, Amal K., 4,360,702, Cl. 136-261.000.
Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., 4,360,448, Cl. 252-309.000.
Pruett, Roy L.; and Bradley, John S., 4,360,475, Cl. 260-441.000.

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Brems, John H.; and Vaphiadis, John L. (said John L. Vaphiadis, a part interest assgn. to), 4,359,945, Cl. 104-89.000.
Liedtke, Rudi J., 4,360,889, Cl. 364-559.000.

Fabbrica D'Armi P. Beretta S.p.A.: *See*—
Beretta, Pier C., 4,359,834, Cl. 42-94.000.

Fabcon, Incorporated: *See*—
Fox, Lonnie G.; Hanson, David W.; and Nash, Richard C., 4,360,333, Cl. 425-299.000.

Fahey, Robert J.; and Norbedo, Robert A., to GTE Products Corp.; and GTE Laboratories Inc. Apparatus for signalling system. 4,360,890, Cl. 364-900.000.

Fahling, Waldo C., to General Motors Corporation. Instrument panel assembly with conductive elastomeric connectors. 4,360,858, Cl. 361-380.000.

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Normann, Richard W.; and Fairbairn, Leroy W., 4,360,185, Cl. 249-175.000.

Faris, Sadeg M., to International Business Machines Corporation. Programmable logic array system incorporating Josephson devices. 4,360,898, Cl. 365-162.000.

Farmer, Douglas A., Jr.: *See*—
Wojtowicz, John A.; and Farmer, Douglas A., Jr., 4,360,671, Cl. 544-192.000.

Farmer, Homer H.: *See*—
Rowan, Eugene V.; and Farmer, Homer H., 4,360,438, Cl. 252-33.600.

Farr, Glyn P. R., to Girling Limited. Control valve assembly. 4,360,238, Cl. 303-24.00A.

Farrar, Jack R.: *See*—
Pachmayr, Frank A.; and Farrar, Jack R., 4,359,833, Cl. 42-71.00P.

Farrington, Frederick; and Clough, Peter S., to British Gas Corporation. Treatment of effluents. 4,360,508, Cl. 423-544.000.

Favorite Manufacturing, Inc.: *See*—
Burkholder, Harvey Z., 4,360,181, Cl. 248-248.000.

Feimer, Bryan A.: *See*—
Brokaw, Paul E.; Adeboi, Frans L.; Feimer, Bryan A.; Freeman, James G.; Kawolics, Raymond P.; and Stanbrook, Frank C., 4,360,129, Cl. 222-146.00H.

Fels, Werner, to Dr. Ing. Rudolf Hell GmbH. Chucking means for printing form plates. 4,359,941, Cl. 101-415.100.

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Fenimore, Edward E.; and Cannon, Thomas M., to United States of America, Energy. Coded aperture imaging with uniformly redundant arrays. 4,360,797, Cl. 340-146.30F.

Ferrin, Charles R.; and Manning, William P., to Combustion Engineering, Inc. Physical solvent for gas sweetening. 4,360,363, Cl. 55-73.000.

Fiberflex Products, Inc.: *See*—
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., 4,360,288, Cl. 403-268.000.

Fields, Ellis K.: *See*—
Nimry, Tayseer S.; and Fields, Ellis K., 4,360,657, Cl. 528-188.000.

Figueroa, Luis; Slayman, Charles W.; and Yen, Huan-Wun, to Hughes Aircraft Company. Integrated waveguide and FET detector. 4,360,246, Cl. 350-96.120.

Findeisen, Kurt; Kratzer, Hans; and Lenthe, Manfred, to Bayer Aktiengesellschaft. Process for the preparation of acyl cyanide compounds. 4,360,479, Cl. 260-545.00R.

Fink, Manfred; and Haendle, Joerg, to Siemens Aktiengesellschaft. X-Ray diagnostic installation. 4,360,731, Cl. 378-42.000.

Finn, Bernard J.: *See*—
Reid, Kenneth H.; and Finn, Bernard J., 4,360,171, Cl. 242-107.200.

Finney, Roy P., to Medical Engineering Corporation. Penile prosthesis. 4,360,010, Cl. 128-79.000.

Fiorella, Charles M., to Texas Instruments Incorporated. Area actuated switch array. 4,360,716, Cl. 200-5.00A.

Firth, Francis G., to Applied Plastics Co., Inc. Kneadable mastic composition comprised of epoxy resin and aromatic curing agent. 4,360,456, Cl. 523-456.000.

Fischel, Halbert: *See*—
Anderson, Robert L., 4,360,323, Cl. 417-349.000.

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Ortner, Herbert; Pfalzer, Lother; and Fischer, Siegbert, 4,360,402, Cl. 162-5.000.

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Alberts, Heinrich; Fischer, Winfried; Leuschke, Christian; and Bartl, Herbert, 4,360,635, Cl. 525-54.450.

Fischer, Wolfgang; and Brown, William J., to PPG Industries, Inc. Trailer transverse rack assembly for shipping sheets. 4,360,298, Cl. 410-32.000.

Fisher, William M. Vehicle with pneumatic assembly for driving, braking, and reducing friction on bearings. 4,360,222, Cl. 280-711.000.

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Zucker, Joseph; and Fitch, Arthur H., 4,360,268, Cl. 356-73.100.

Fitzgerald, James J., to Edison International. Baseless lamp socket. 4,360,861, Cl. 362-211.000.

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Fitzsimmons, George W.; Lund, Walter W., Jr.; and Nalos, Ervin J., to Boeing Company, The. Combined antenna-rectifier arrays for power distribution systems. 4,360,741, Cl. 307-151.000.

Fitzsimmons, George W., to Boeing Company, The. Power combining antenna structure. 4,360,813, Cl. 343-100.00R.

Flaig, Ulrich: *See*—
Stumpp, Gerhard; Walz, Ludwig; Schielinsky, Gerhard; Wessel, Wolf; Kuttner, Thomas; Flaig, Ulrich; Piwonka, Fridolin; Eisele, Hermann; Boehringer, Andreas; Kubach, Hans; Locher, Johannes; and Becker, Waldemar, 4,359,991, Cl. 123-478.000.

Flanders, Dale C.; and Smith, Henry I., to Massachusetts Institute of Technology. Spatial period division exposing. 4,360,586, Cl. 430-321.000.

Fletcher, Ivan M.; and Meier, Richard H., to Western Electric Company, Inc. Electroplating processes and equipment utilizing a foam electrolyte. 4,360,410, Cl. 204-23.000.

Fletcher, Laird C.; Beard, Harold J.; and O'Blasny, Richard, to Delta Central Refining, Inc. Distillation and solvent extraction process for rerefining used lubricating oil. 4,360,420, Cl. 208-184.000.

Floyd, Middleton B., Jr., to American Cyanamid Company. Precursors and synthesis of d1-(methyl)-16,16-(dimethyl)-11-alpha, 15-alpha, beta-dihydroxy-9-oxo-2,13,-trans, trans-prostadienoates. 4,360,688, Cl. 556-441.000.

Fly, Anderson B. Mineral leaching. 4,360,500, Cl. 423-1.000.

FMC Corporation: *See*—
Wetzel, Jack D., 4,360,426, Cl. 210-160.000.

Fontaine, Raymond C., to Textron, Inc. Adjustable length strap with non-expansible non-metallic strap members interconnected by a metallic coupling device. 4,359,808, Cl. 24-71.00R.

Forbes, Hampton E., Jr., to Westvaco Corporation. Sliding lid for tapered tray. 4,360,148, Cl. 229-43.000.

Ford, John W., Jr.: *See*—
Eloranta, Vaito K.; and Ford, John W., Jr., 4,360,260, Cl. 354-304.000.

Ford Motor Company: *See*—
Rahnke, Christian J., 4,360,316, Cl. 417-64.000.
Vallance, James K.; and Rahnke, Christian J., 4,360,317, Cl. 417-64.000.

Forney, Edgar W., Jr.; and Hogendobler, Richard S., to AMP Incorporated. Miniature coaxial connector assembly. 4,360,244, Cl. 339-177.00R.

Forney, Joseph M.: *See*—
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Forster, Alette J.; and Ockers, Muriel M., to OMEX. Laser recording medium. 4,360,820, Cl. 346-135.100.

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Brock-Nannestad, Lars V., 4,360,914, Cl. 371-2.000.

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Stewart, Robert D., 4,359,968, Cl. 122-4.00D.

Fouss, James L.; Parker, John J.; Child, James L., Jr.; and Sting, Donald W., to Hancor, Inc. Arched conduit with improved corrugations. 4,360,042, Cl. 138-119.000.

Fox, Lonnie G.; Hanson, David W.; and Nash, Richard C., to Fabcon, Incorporated. Aggregate exposing machine. 4,360,333, Cl. 425-299.000.

Frame, Robert R., to UOP Inc. Method for treating mercaptans contained in a sour petroleum distillate. 4,360,421, Cl. 208-207.000.

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Meyer, Horst; Franckowiak, Gerhard; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,360,520, Cl. 424-250.000.

Frank, Paul A.; and Griffing, Bruce F., to General Electric Company. Method of etching polymethyl methacrylate. 4,360,585, Cl. 430-312.000.

Fransson, George E.; Johnson, Stuart J.; and Haug, Edward J., to Barber-Colman Company. Hobbing apparatus with orbiting hob. 4,360,296, Cl. 409-17.000.

Frantom, Richard L.: *See*—
Thomas, Rudy V.; Stephenson, Robert L.; and Frantom, Richard L., 4,360,225, Cl. 280-804.000.

Franz, Arnold: *See*—
Kopnick, Siegfried; Huthwelker, Dirk; Franz, Arnold; and Jacob, Lothar, 4,360,560, Cl. 428-236.000.

Franz, Helmut; Duffer, Paul F.; and Kelly, Joseph D., to PPG Industries, Inc. Organotin surface treatment and interleaving material for glass sheets. 4,360,544, Cl. 427-165.000.

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Freedman, Robert, to Shell Oil Company. High frequency induction log for locating formation interfaces. 4,360,778, Cl. 324-339.000.

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Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., 4,360,288, Cl. 403-268.000.

Freidinger, Roger M.; and Veber, Daniel F., to Merck & Co., Inc. Modified D-retro cyclic hexapeptide somatostatin analogs. 4,360,516, Cl. 424-177.000.

Freyman, Ronald L., to Bell Telephone Laboratories, Incorporated. Synchronous binary-counter and programmable rate divider circuit. 4,360,742, Cl. 307-224.00C.

Fricke, Hans-Jurgen, to Robert Bosch GmbH. Sliding piston joint of a hydrostatic piston machine. 4,359,933, Cl. 92-181.00R.

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Erps, Floyd D.; and Fried, Raymond L., 4,360,788, Cl. 331-1.00A.

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Dietz, Kurt; and Friedel, Rudolf, 4,360,734, Cl. 378-93.000.

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Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik: *See*—
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Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,360,528, Cl. 424-269.000.
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,360,529, Cl. 424-269.000.

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Frommer, Moshe A.: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,360,480, Cl. 260-944.000.

Frommlet, Hubert; and Stangl, Ludwig, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Damping device for a helicopter rotor blade. 4,360,337, Cl. 416-141.000.

Frost, Donald J., to Modine Manufacturing Company. Heat exchanger. 4,360,055, Cl. 165-38.000.

Frund, Louis: *See*—
Baseggio, Marcello; and Frund, Louis, 4,359,881, Cl. 66-149.00R.

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Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with 1-aryl-cyclopropane-1-carboxylic acid esters. 4,360,690, Cl. 560-57.000.

Fuchs, Siegfried; and Stemmler, Kurt, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Rotary punch comprising a backup roll bearing on the cutter roll. 4,359,919, Cl. 83-349.000.

Fugardi, Joseph F.: *See*—
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., 4,360,142, Cl. 228-123.000.

Fugate, Kidd S., to River Processing, Inc. Method and apparatus for separating materials of lighter and heavier specific gravities and cleaning the material of lighter specific gravity. 4,360,423, Cl. 209-17.000.

Fuji Eizai Kabushikikaisha: *See*—
Usami, Akira; Kotani, Motoharu; and Goda, Tomoko, 4,360,022, Cl. 128-290.00R.

Fuji Photo Film Co., Ltd.: *See*—
Kojima, Tetsuro; Morigaki, Masakazu; Hamaoka, Tsutomu; and Sawada, Satoru, 4,360,589, Cl. 430-551.000.
Watarai, Shu; Ishii, Kazuo; and Takayama, Takeshi, 4,360,660, Cl. 528-266.000.

Fuji Photo Optical Co., Ltd.: *See*—
Matui, Nobuo, 4,360,835, Cl. 358-225.000.

Fuji Xerox Co., Ltd.: *See*—
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,360,818, Cl. 346-76.0PH.

Fujii, Jiro: *See*—
Miyoshi, Yoshitake; Fujii, Jiro; Nakanishi, Tsugio; Takahashi, Ichiro; Tsudaka, Hideaki; and Kai, Masami, 4,360,263, Cl. 355-29.000.

Fujikawa, Noboru: *See*—
Taguchi, Tadashi; Fujikawa, Noboru; Kohno, Mitsuo; Yoshitake, Katsumi; and Satake, Kunio, 4,360,582, Cl. 430-260.000.

Fujitsu Fanuc Limited: *See*—
Toyoda, Kenichi, 4,359,815, Cl. 29-568.000.

Fujitsu Limited: *See*—
Fujiwara, Takao; Hanamitsu, Kiyoshi; Ohsaka, Sigeo; Ishikawa, Hiroshi; Takagi, Nobuyuki; and Segi, Katsuharu, 4,360,919, Cl. 372-45.000.

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Fukuda, Norisuke; and Mori, Leo, to Tokyo Shibaura Denki Kabushiki Kaisha. Microwave oven. 4,360,723, Cl. 219-10.55B.

Fukumoto, Yoshikatsu: *See*—
Saito, Tamio; Fukumoto, Yoshikatsu; and Tagaya, Kiyomi, 4,360,819, Cl. 346-76.0PH.
Fukumoto, Yuji: *See*—
Ono, Syoji; Fukumoto, Yuji; and Yoshida, Tsunemasa, 4,360,457, Cl. 260-112.00B.
Fukunaga, Yukio, to Nissan Motor Company, Limited. Instrument panel. 4,360,241, Cl. 339-10.000.
Fulbright & Jaworski: *See*—
Boyer, Harold F.; and Webb, John L., 4,360,440, Cl. 252-62.000.
Funk, Gary L.: *See*—
Stewart, William S.; and Funk, Gary L., 4,360,882, Cl. 364-494.000.
Funke, Karl-Heinz, to Funke Warmeaustauscher Apparatebau KG. Tube type heat exchanger. 4,360,059, Cl. 165-160.000.
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Funke, Karl-Heinz, 4,360,059, Cl. 165-160.000.
Funo, Takakazu: *See*—
Okada, Kunihiro; Endo, Takeyuki; Yabuuchi, Shigeru; Funo, Takakazu; Kodama, Kazuyuki; and Shibuya, Yasutaka, 4,360,884, Cl. 364-521.000.
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Asano, Masaharu; Tamura, Hideyuki; and Furuhashi, Shoji, 4,359,992, Cl. 123-480.000.
Futamura, Yoshiki: *See*—
Maruyama, Eisuke; Kobayashi, Hiromitsu; Mitsuhashi, Masakazu; Takeuchi, Hiromichi; Futamura, Yoshiki; and Suzuki, Naohito, 4,360,127, Cl. 222-14.000.
G.B. Boucherie, Naamloze Vennootschap, Firma: *See*—
Boucherie Leonel P., 4,360,236, Cl. 300-9.000.
G & R Electro-Powder Coating Corporation: *See*—
Hubbell, Mark E.; and Riebe, Alan R., 4,360,155, Cl. 239-3.000.
Gafa, Salvatore: *See*—
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,360,439, Cl. 252-61.000.
Gagliani, John; Lee, Raymond; and Sorathia, Usman A. K., to International Harvester Co. Polyimide foams. 4,360,604, Cl. 521-189.000.
Gaines, Marvin E.: *See*—
Copp, Carl A., Jr.; Pandzik, Richard T.; and Gaines, Marvin E., 4,360,321, Cl. 417-269.000.
Galloway, Charles W., to United States of America, National Aeronautics and Space Administration. Gas-to-hydraulic power converter. 4,360,325, Cl. 417-399.000.
Galpin, Robert K. P., to Plessey Overseas Limited. Digitally controlled wide ranch automatic gain control. 4,360,787, Cl. 330-284.000.
Gambling, William A.: *See*—
Payne, David N.; and Gambling, William A., 4,360,250, Cl. 350-96.300.
Garbark, Roman F., to D. Gottlieb & Co. Rollover switch for pinball game. 4,360,203, Cl. 273-121.00A.
Garhammer, Arnold: *See*—
Hechtl, Wolfgang; and Garhammer, Arnold, 4,360,654, Cl. 528-18.000.
Garney, Tom A., to Dresser Industries, Inc. Apparatus for mounting a sensing device in a well logging instrument. 4,359,900, Cl. 73-151.000.
Garofalo, Giovanni, to AMF Incorporated. Speargun with trigger mechanism for releasing a line tethered to a spear. 4,359,999, Cl. 124-80.000.
Garoutte, Kurt F.: *See*—
Chua, David L.; Garoutte, Kurt F.; and Levy, Louis L., 4,360,572, Cl. 429-53.000.
Gasior, Walter: *See*—
Campbell, Frederick S.; Trask, Elwood G.; Gasior, Walter; and Phaneuf, Roland, 4,360,554, Cl. 428-91.000.
Gasser, Oswald: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, 4,360,605, Cl. 523-116.000.
Gatti, Alfonso: *See*—
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,360,439, Cl. 252-61.000.
Gauhl, Helmgard: *See*—
Beaucamp, Klaus; Nelboeck, Michael; Gauhl, Helmgard; Seidel, Hans; Gruber, Wolfgang; and Brunner, Herwig, 4,360,596, Cl. 435-197.000.
Gavin, Donald A., to United States of America, Energy. Wedges for ultrasonic inspection. 4,359,905, Cl. 73-644.000.
Geary, John M., to Bell Telephone Laboratories, Incorporated. Multitrack ferroelectric device. 4,360,894, Cl. 365-117.000.
Gebert, Wolfgang: *See*—
Magnussen, Peter; Schumacher, Volker; Gebert, Wolfgang; Reitz, Heinrich; and Praetorius, Werner, 4,360,695, Cl. 562-590.000.
Gebruder Sulzer, Aktiengesellschaft Protek A.G.: *See*—
Niederer, Peter G., 4,359,785, Cl. 3-1.913.
Gehring, Johann: *See*—
Stoeger, Klaus; Birkle, Siegfried; and Gehring, Johann, 4,360,409, Cl. 204-14.00N.
Geiger, Dana F.: *See*—
Arnold, Frank, Jr.; and Geiger, Dana F., 4,360,751, Cl. 310-60.00R.
General Electric Company: *See*—
Andrews, Edward W.; and Williams, Eugene C., 4,360,805, Cl. 340-744.000.
Bloomer, Milton D.; Ciccone, Joseph L.; Harnden, John D., Jr.; Kornrumpf, William P.; and Shattuck, Donald P., 4,360,847, Cl. 361-3.000.
Bolon, Donald A.; and Gorczyca, Thomas B., 4,360,633, Cl. 524-845.000.
Bowen, William A.; and Williams, James W., 4,360,927, Cl. 455-17.000.
Coyne, Gerard G., 4,359,877, Cl. 62-278.000.
Davidson, Craig R.; and Sedlak, John M., 4,360,416, Cl. 204-266.000.
Engle, Gary L.; and Cribbs, Robert W., 4,359,904, Cl. 73-620.000.
Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., 4,360,552, Cl. 428-36.000.
Frank, Paul A.; and Griffing, Bruce F., 4,360,585, Cl. 430-312.000.
Haag, Norbert P.; and Irish, William D., 4,359,812, Cl. 29-458.000.
Hallgren, John E.; and Lucas, Gary M., 4,360,477, Cl. 260-463.000.
McAndrew, Miles J., 4,360,370, Cl. 55-302.000.
McCarty, William J., 4,359,874, Cl. 62-117.000.
McCarty, William J., 4,359,876, Cl. 62-180.000.
Morris, Jesse L., 4,360,140, Cl. 226-162.000.
Olashaw, William F., 4,360,857, Cl. 361-361.000.
Perras, Arnold M., 4,359,908, Cl. 73-863.850.
Philipp, Herbert R., 4,360,564, Cl. 428-336.000.
Rabatin, Jacob G., 4,360,571, Cl. 428-691.000.
Sawyer, Quentan T., 4,359,928, Cl. 89-12.000.
Sikdar, Subhas K., 4,360,659, Cl. 528-196.000.
Smearing, Robert W., 4,360,446, Cl. 252-428.000.
Spencer, John E.; and Bhattacharya, Ashok K., 4,360,756, Cl. 313-179.000.
Tassie, Douglas P., 4,359,927, Cl. 89-12.000.
Urquhart, Andrew W., 4,360,389, Cl. 148-11.50F.
General Motors Corporation: *See*—
Blaser, Dwight A.; Goding, David J.; and Ingard, Karl U., 4,360,075, Cl. 181-250.000.
Brandenburg, Darrell L., 4,360,284, Cl. 403-133.000.
Carlson, Clifford R.; and Voelkle, Leo H., 4,359,983, Cl. 123-339.000.
Carlson, Clifford R., 4,359,993, Cl. 123-492.000.
Copp, Carl A., Jr.; Pandzik, Richard T.; and Gaines, Marvin E., 4,360,321, Cl. 417-269.000.
Dickman, John E.; and Donley, William B., 4,359,817, Cl. 29-571.000.
Eubanks, Kenneth B.; and Loeb, Clifford E., 4,359,911, Cl. 74-552.000.
Fahling, Waldo C., 4,360,858, Cl. 361-380.000.
Pendergast, Joseph P., 4,360,085, Cl. 188-315.000.
Reid, Kenneth H.; and Finn, Bernard J., 4,360,171, Cl. 242-107.200.
Voss, Richard J., 4,360,772, Cl. 322-28.000.
Voss, Richard J., 4,360,773, Cl. 322-28.000.
Williams, Donald L., 4,360,163, Cl. 239-533.500.
Wonn, Quinby E., 4,360,090, Cl. 192-3.300.
Genin, Robert D.: *See*—
Yasumura, Gary; Genin, Robert D.; and Wetenkamp, Scott F., 4,360,865, Cl. 363-126.000.
Genthe, James E., to Pitney Bowes Inc. Electrophotocopier charging and transfer roller. 4,360,262, Cl. 355-3.0CH.
Georgopulos, Thomas, to GTE Automatic Electric Labs Inc. Designation cap actuator assembly. 4,360,722, Cl. 200-314.000.
Geosource Inc.: *See*—
Banks, James W., 4,359,797, Cl. 15-104.06A.
Harvey, Donald W.; and Bacha, Donald J., 4,360,729, Cl. 250-227.000.
Gergis, Isoris S., to Rockwell International Corporation. Segmented stretcher detector for magnetic bubble domain devices. 4,360,904, Cl. 365-12.000.
Gesior, Augustyn M.; and Robinson, Edward L., Jr., to International Harvester Co. Planter quick attachable granular chemical hopper assembly. 4,359,952, Cl. 111-80.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Beckmann, Klaus, 4,360,102, Cl. 198-729.000.
Ghaznavi, Mansour. Mathematical educational game devices. 4,360,347, Cl. 434-198.000.
Ghosh, Amal K.: *See*—
Feng, Tom; and Ghosh, Amal K., 4,360,702, Cl. 136-261.000.
Gianotti, Joseph C., Trustee: *See*—
Davila, Jose E.; Davila, Efrain A.; and Gomez, Jim H., 4,360,034, Cl. 133-3.00D.
Gifford, John F.; Sliger, Edward; and Leal, Joaquin. Positional control device. 4,360,308, Cl. 414-572.000.
Gilmore, Thomas P., to Allis-Chalmers Corporation. Overcurrent and overtemperature protective circuit for power transistor system. 4,360,852, Cl. 361-98.000.
Girault, Herve; Reymond, Jean C.; and Cauzan, Pierre, to Thomson-CSF. Cartographic indicator system. 4,360,876, Cl. 364-449.000.
Girling Limited: *See*—
Farr, Glyn P. R., 4,360,238, Cl. 303-24.00A.
Giusberti, Roberto: *See*—
Bellicardi, Francesco; Zucchi, Giorgio; and Giusberti, Roberto, 4,360,164, Cl. 239-585.000.
Glacier Metal Company Limited, The: *See*—
Hill, Alfred; and Baker, Robert G., 4,360,208, Cl. 277-153.000.
Goble, Charles M., to Trim-Gard Company Ltd. Luggage carrier. 4,360,135, Cl. 224-42.080.
Goda, Tomoko: *See*—
Usami, Akira; Kotani, Motoharu; and Goda, Tomoko, 4,360,022, Cl. 128-290.00R.
Goding, David J.: *See*—
Blaser, Dwight A.; Goding, David J.; and Ingard, Karl U., 4,360,075, Cl. 181-250.000.
Goedemans, Wilhelmus T., to Byk-Mallinckrodt CIL B.V. Vivo radioassay process. 4,360,509, Cl. 424-1.000.

Goeman, Friedrich, to W. R. Bonsal Company. Insulated wall construction having a clip and fastener therein. 4,359,849, Cl. 52-479.000.

Goldberg, Mel, to Topstone Industries, Inc. Headdress display device. 4,360,134, Cl. 223-66.000.

Golden, Edward J.: *See*—
Sano, Frank M.; Golden, Edward J.; and Sliwa, Robert A., 4,359,926, Cl. 89-1.814.

Goldman, Ilan. Key-operated locks. 4,359,885, Cl. 70-355.000.

Goldowsky, Michael P., to North American Philips Corporation. Low temperature regenerators for cryogenic coolers. 4,359,872, Cl. 62-6.000.

Goldsmith, Sydney A. Harvesting apparatus. 4,359,855, Cl. 56-330.000.

Goldstein, Richard, to Dynascan Corporation. Wall switch opening mounted power circuit timer-controller. 4,360,739, Cl. 307-132.00E.

Golias, Tipton L., to Helena Laboratories Corporation. Electrophoresis and staining apparatus. 4,360,418, Cl. 204-299.00R.

Gomaco, Inc.: *See*—
Wade, Arthur W., 4,360,293, Cl. 405-268.000.

Gomez, Jim H.: *See*—
Davila, Jose E.; Davila, Efrain A.; and Gomez, Jim H., 4,360,034, Cl. 133-3.00D.

Gonda, Joseph, to Bell Telephone Laboratories, Incorporated. Broadband frequency multiplication by multitransition operation of step recovery diode. 4,360,867, Cl. 363-158.000.

Gonopolsky, Oleg L.: *See*—
Venin, Igor V.; Gonopolsky, Oleg L.; Zhuk, Valery P.; Rodionov, Vladimir I.; Smerdov, Andrei A.; and Tischenko, Alexandr G., 4,360,026, Cl. 128-419.00D.

Goodman, Richard M.: *See*—
Lim, Sim K.; and Goodman, Richard M., 4,360,425, Cl. 209-167.000.

Goodyear Aerospace Corporation: *See*—
Knaus, Ernest; Namsick, Raymond J.; and Smith, Herbert D., 4,360,124, Cl. 220-452.000.

Goodyear Tire & Rubber Company, The: *See*—
Brown, Jack E., Jr.; Christie, Christopher E.; Forney, Joseph M.; and Underwood, Richard M., 4,359,896, Cl. 73-146.000.

Gorczyca, Thomas B.: *See*—
Bolon, Donald A.; and Gorczyca, Thomas B., 4,360,633, Cl. 524-845.000.

Gotou, Makoto: *See*—
Akiyama, Ryo; and Gotou, Makoto, 4,360,767, Cl. 318-318.000.

Gould, Gordon: *See*—
Schmadel, Donald; Culver, William H.; and Gould, Gordon, 4,360,272, Cl. 356-352.000.

Gould Inc.: *See*—
Beasley, J. Donald, 4,360,247, Cl. 350-96.150.

Grabmaier, Josef: *See*—
Schneider, Hartmut; and Grabmaier, Josef, 4,360,546, Cl. 427-255.000.

Grassl, Hans-Peter, to Siemens Aktiengesellschaft. Single reflex camera with an optoelectronic distance meter mounted in the vicinity of the view finder eyepiece. 4,360,256, Cl. 354-25.000.

Gray, Alan, to British Aluminum Company Limited, The. Method for making aluminum alloy lithographic plates or Al/Ca lithographic alloy. 4,360,401, Cl. 156-665.000.

Greci, John J.: *See*—
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,360,555, Cl. 428-107.000.

Green-Gard Associates: *See*—
English, John A., 4,360,200, Cl. 273-34.00R.

Green, John G., to Dow Chemical Company, The. Method of concentrating a solution of methylene diphenyl diisocyanate in diphenyl oxide. 4,360,476, Cl. 260-453.0SP.

Gregor, Lawrence V.: *See*—
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., 4,360,142, Cl. 228-123.000.

Grenlund, Wesley F., to Beloit Corporation. On-machine battery recharging system. 4,360,771, Cl. 320-61.000.

Griffing, Bruce F.: *See*—
Frank, Paul A.; and Griffing, Bruce F., 4,360,585, Cl. 430-312.000.

Griffith, Edward J., to Monsanto Company. Acicular, crystalline calcium metaphosphate. 4,360,625, Cl. 524-414.000.

Grogler, Gerhard; Rasshofer, Werner; and Kopp, Richard, to Bayer Aktiengesellschaft. Process for the preparation of compounds containing s-triazine units and isocyanate groups or isocyanate-reactive groups and the production of polyurethanes containing these fillers. 4,360,603, Cl. 521-159.000.

Grollier-Baron, Therese: *See*—
Paris, Rene A.; and Grollier-Baron, Therese, 4,360,506, Cl. 423-327.000.

Gromov, Nikolai F.: *See*—
Silka, Adolf N.; Minasov, Alexandr N.; Kulakov, Nikolai K.; Likhogub, Evgeny P.; Dorfman, Gersh A.; Azimov, Alexandr A.; Davydenko, Vladimir M.; Marapulets, Gennady N.; Shestakov, Valentin A.; and Gromov, Nikolai F., 4,360,403, Cl. 202-263.000.

Grosewald, Peter S.: *See*—
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., 4,360,142, Cl. 228-123.000.

Grosskinsky, Otto-Alfred: *See*—
Fuchs, Hugo; Frommer, Elmar; and Grosskinsky, Otto-Alfred, 4,360,461, Cl. 260-239.30A.

Grossoleil, Jacques: *See*—
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,360,561, Cl. 428-288.000.

Grover, Albert D. Hollow keel heat exchanger for marine vessels. 4,360,350, Cl. 440-88.000.

Gruber, Wolfgang: *See*—
Beaucamp, Klaus; Nelboeck, Michael; Gauhl, Helmgard; Seidel, Hans; Gruber, Wolfgang; and Brunner, Herwig, 4,360,596, Cl. 435-197.000.

Gruen, Dieter M.: *See*—
Mendelsohn, Marshall H.; and Gruen, Dieter M., 4,360,445, Cl. 252-181.600.

Grunewalder, John F., to PPG Industries, Inc. Water repellent compositions for the treatment of wood. 4,360,385, Cl. 106-2.000.

Grunewalder, John F.: *See*—
Castellucci, Nicholas T.; Grunewalder, John F.; and Ostrowski, John S., 4,360,614, Cl. 523-421.000.

Gruppo Lepetit S.p.A.: *See*—
Omodei-Sale, Amedeo; and Toia, Emilio, 4,360,674, Cl. 546-199.000.

Gryzinski, Michal, to Instytut Badan Jadrowych. Method and device for control of great currents particularly of the pulse type. 4,360,763, Cl. 315-111.010.

GTE Automatic Electric Labs Inc.: *See*—
Branson, Carl B., 4,360,746, Cl. 307-494.000.
Georgopulos, Thomas, 4,360,722, Cl. 200-314.000.
Zucker, Joseph; and Fitch, Arthur H., 4,360,268, Cl. 356-73.100.

GTE Laboratories Inc.: *See*—
Fahey, Robert J.; and Norbedo, Robert A., 4,360,890, Cl. 364-900.000.

GTE Products Corporation: *See*—
Armstrong, Donald E., 4,360,103, Cl. 206-482.000.
Boyer, Carl W.; Christini, James N.; and Vogt, Martin C., 4,360,503, Cl. 423-54.000.
Fahey, Robert J.; and Norbedo, Robert A., 4,360,890, Cl. 364-900.000.
MacInnis, Martin B.; McClintic, Robert P.; and Kim, Tai K., 4,360,502, Cl. 423-54.000.
Roche, William J., 4,360,761, Cl. 315-60.000.

Guarino, John P.; and Schwab, Frederick C., to Mobil Oil Corporation. Flexible film laminate especially adapted for use in the construction of a retortable food pouch. 4,360,551, Cl. 428-35.000.

Gubitose, Nicholas F.; Schuler, Malcolm R.; and Patterson, David L., to RCA Corporation. Bellows assembly for crystal ribbon puller. 4,360,499, Cl. 422-246.000.

Guilbault, Lawrence J.: *See*—
Wade, Robert C.; Guilbault, Lawrence J.; and Rei, Nuno M., 4,360,623, Cl. 524-404.000.

Guillevic, Gildas J. M., to Corning Glass Works. Easy-to-clean glass or glass-ceramic cookware in the alkaline earth metal oxide-Al_2O_3-Sio field. 4,360,567, Cl. 428-410.000.

Gulf Oil Corporation: *See*—
Wisneski, Peter M., 4,360,044, Cl. 141-9.000.

Gulf & Western Manufacturing Company: *See*—
Strasser, Frederick G.; and Horwinski, Elwood R., 4,360,862, Cl. 362-240.000.

Gunther, Wolf: *See*—
Schleese, Eckard; Gunther, Wolf; and Buddensiek, Willi, 4,359,860, Cl. 57-293.000.

Gurak, Ronald W.: *See*—
Sauer, L. Peter; and Gurak, Ronald W., 4,359,936, Cl. 100-2.000.

Gutman, Rodika: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,360,480, Cl. 260-944.000.

Guyer, Robert R.: *See*—
Nettesheim, Daniel R.; and Guyer, Robert R., 4,360,267, Cl. 355-132.000.

H. G. Wallace Limited: *See*—
Wallace, Henry G., 4,360,024, Cl. 604-256.000.

H. P. Hood, Inc.: *See*—
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Koch, Gerhard, 4,360,282, Cl. 403-19.000.

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Hahn, James R., to Dow Corning Corporation. Flowable, room temperature vulcanizable silicone composition. 4,360,631, Cl. 524-788.000.
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Debaise, Michel J., 4,360,133, Cl. 222-590.000.
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Monroe, Paul S., 4,359,811, Cl. 29-421.00R.
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Hallgren, John E.; and Lucas, Gary M., to General Electric Company. Carbonylation of alkanols. 4,360,477, Cl. 260-463.000.
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Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler and labeling method. 4,360,399, Cl. 156-277.000.
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Hammond, Dennis L.: *See*—
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Fouss, James L.; Parker, John J.; Child, James L., Jr.; and Sting, Donald W., 4,360,042, Cl. 138-119.000.
Hansch, Ferdinand: *See*—
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Hardy, Willie J. Wood burning hot water heater. 4,360,003, Cl. 126-368.000.
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Harrington, Shirley L. Sleeve-mitten combination for garment. 4,359,784, Cl. 2-269.000.
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Harrison, Bill L. Moisture barrier system for earth-sheltered housing. 4,359,845, Cl. 52-169.600.
Harrison, Shelley A.: *See*—
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Hartman, Clinton S.: *See*—
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Haslanger, Martin F.; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. Dioxatricyclic prostacyclin analogs. 4,360,685, Cl. 549-386.000.
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Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, to Nippondenso Co., Ltd. Power transmission system. 4,360,353, Cl. 474-12.000.
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Hechtl, Wolfgang; and Garhammer, Arnold, to Wacker-Chemie GmbH. Reaction products of silicic acid esters and organic tin compounds. 4,360,654, Cl. 528-18.000.
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Hefner, Robert E., Jr., to Dow Chemical Company, The. Phosphonate terminated dicyclopentadiene modified polyesters. 4,360,647, Cl. 525-445.000.
Heider, James E., to Owens-Illinois, Inc. Foamed low density polyethylene sheet material and carrier. 4,360,556, Cl. 428-131.000.
Heidner, Richard C. Starting apparatus for two cycle engine. 4,359,975, Cl. 123-73.00R.
Heiland, Bernd, to Aug. Winkhaus. Door lock assembly with electrical alarm. 4,360,803, Cl. 340-542.000.
Hein, George N., Jr. Centrifuge rotor with liquid supported swinging tubes. 4,360,149, Cl. 233-26.000.
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Hellwig, Kurt E., to Burroughs Corporation. Telephone moveable cradle lock. 4,360,714, Cl. 179-189.00R.
Helms, Charles R., to Container Corporation of America. Easy-open lid closure arrangement. 4,360,121, Cl. 220-270.000.
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Hengartner, Urs; Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. 7[3,6-Dihydro-1(2H)-pyridyl]-2-oxo-2H-[1,2,4]oxadiazolo[2,3-c]pyrimidine-5-carbamate compounds. 4,360,521, Cl. 424-251.000.
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Herder, Robert O. Sectional lined end box for chemical cell. 4,360,498, Cl. 422-241.000.
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Hijikata, Kenji; and Sakaguchi, Kouichi, to Mitsubishi Petrochemical Co., Ltd. Epoxy resin-bitumen material composition. 4,360,608, Cl. 523-450.000.
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Hitchcock, James R., Jr.; and Nevens, Charles J., to Baxter Travenol Laboratories, Inc. Disposable swab. 4,360,020, Cl. 128-269.000.
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Hofer, Gerald; Konrath, Karl; and Laufer, Helmut, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,359,994, Cl. 123-502.000.
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Bernauer, Karl; and Pfoertner, Karlheinz, 4,360,530, Cl. 424-272.000.
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Hooker, Rea F. Trapezoidal structures. 4,359,842, Cl. 52-18.000.
Hool, Sherman W. Labyrinth crib toy. 4,359,837, Cl. 46-43.000.
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Huang, Joseph M. G.; Capwell, Robert J.; and De Sesa, Michael A., to Anzon America, Inc. Smoke and fire retardants for halogen-containing plastic compositions. 4,360,624, Cl. 524-411.000.
Hubbell, Mark E.; and Riebe, Alan R., to G & R Electro-Powder Coating Corporation. Powder coating distributor. 4,360,155, Cl. 239-3.000.
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Hynecek, Jaroslav: *See*—
Chapman, Richard A.; Lewis, Adam J., Jr.; Hynecek, Jaroslav; and Kinch, Michael A., 4,360,732, Cl. 250-332.000.
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Wakimoto, Saburo; Miyahara, Sadayasu; and Hyosu, Yoshihiko, 4,360,611, Cl. 523-216.000.
Ichimura, Hiroshi: *See*—
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Ide-Produktion Ralf Larsson: *See*—
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Oka, Naoki; Tanaka, Nobuo; and Ando, Takashi, 4,360,422, Cl. 209-5.000.
Ideta, Yasufumi, to Nissan Motor Co., Ltd. Hydraulic power boost apparatus. 4,359,869, Cl. 60-547.00B.
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Imperial Chemical Industries Limited: *See*—
Barham, Peter J.; and Selwood, Alan, 4,360,488, Cl. 264-210.100.
Smith, Clive P., 4,360,630, Cl. 524-592.000.
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Lanfranconi, Gianmario; and Vecellio, Bernardino, 4,360,706, Cl. 174-105.0SC.
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Blaser, Dwight A.; Goding, David J.; and Ingard, Karl U., 4,360,075, Cl. 181-250.000.
Ingenium Ingenieurgesellschaft fur Mehrzweckbauten Industrieanlagen und Gelandenutzung mbH, Bau-Kommanditgesellschaft: *See*—
Psotta, Ewald, 4,360,283, Cl. 403-104.000.
Inohara, Masanobu, to Asics Corporation. Sport shoe sole. 4,359,830, Cl. 36-29.000.
Institut Francais du Petrole: *See*—
Delamare, Guy R., 4,359,959, Cl. 114-230.000.
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Gryzinski, Michal, 4,360,763, Cl. 315-111.010.
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Abbas, Shakir A.; and Magdo, Ingrid E., 4,359,816, Cl. 29-571.000.
Cammarano, Armando S.; and DiGiacomo, Giulio, 4,360,289, Cl. 403-272.000.
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., 4,360,142, Cl. 228-123.000.
Corner, Gary W.; and Jorgenson, Gary W., 4,360,768, Cl. 318-389.000.
Engler, Edward M.; Kaufman, Frank B.; Kramer, Steven R.; and Scott, Bruce A., 4,360,583, Cl. 430-270.000.
Faris, Sadeg M., 4,360,898, Cl. 365-162.000.
Helinski, Edward F., 4,359,937, Cl. 101-93.040.
McVey, James M., 4,360,870, Cl. 364-200.000.
International Flavors & Fragrances Inc.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwi'a, Jacob, 4,360,032, Cl. 131-276.000.
International Harvester Co.: *See*—
Gagliani, John; Lee, Raymond; and Sorathia, Usman A. K., 4,360,604, Cl. 521-189.000.
Gesior, Augustyn M.; and Robinson, Edward L., Jr., 4,359,952, Cl. 111-80.000.
Sullivan, Herbert D., 4,360,122, Cl. 220-295.000.
Swanson, William C., 4,359,867, Cl. 60-413.000.
Weisman, Roland E., 4,360,083, Cl. 188-218.00A.
International Road Dynamics Inc.: *See*—
Dyck, George J., 4,360,071, Cl. 177-208.000.
International Standard Electric Corporation: *See*—
Roberts, Daniel F. T., 4,360,392, Cl. 148-23.000.
International Telephone and Telegraph Corporation: *See*—
Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., 4,360,863, Cl. 362-346.000.
Bickel, Gary W.; and Baldwin, David L., 4,360,248, Cl. 350-96.160.
Tan, Chee-Teck; Howard, Gail P.; and Turner, Earl W., 4,360,537, Cl. 426-656.000.
Irish, William D.: *See*—
Haag, Norbert P.; and Irish, William D., 4,359,812, Cl. 29-458.000.
Irvine, James E. B.; and Parcels, J. Roy, to Youngs Drug Products Corporation. Display mountable container having recloseable feature. 4,360,106, Cl. 206-621.000.
Isett, Don D.: *See*—
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,359,953, Cl. 112-121.110.
Ishida, Kunio, to Tokico Ltd. Gas spring, filling and sealing structure. 4,360,192, Cl. 267-64.280.
Ishii, Kazuo: *See*—
Watarai, Shu; Ishii, Kazuo; and Takayama, Takeshi, 4,360,660, Cl. 528-266.000.
Ishii, Tadashi, to Kobishi Electric Co., Ltd. Gong striking mechanism. 4,360,800, Cl. 340-396.000.
Ishikawa, Hiroshi: *See*—
Fujiwara, Takao; Hanamitsu, Kiyoshi; Ohsaka, Sigeo; Ishikawa, Hiroshi; Takagi, Nobuyuki; and Segi, Katsuharu, 4,360,919, Cl. 372-45.000.
Ishimaru, Kenzo; and Nielsen, Steven T., to Beckman Instruments, Inc. Centrifuge apparatus for reorienting gradients. 4,360,150, Cl. 233-26.000.
Isobe, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Automatic gain control circuit. 4,360,929, Cl. 455-245.000.
Isono, Tokio, to Honda Giken Kogyo Kabushiki Kaisha. Shock absorbing device for rear wheel of motorcycle. 4,360,214, Cl. 280-284.000.
Itek Corporation: *See*—
Breslow, Donald H., 4,360,730, Cl. 250-231.0SE.
Ito, Hiroshi; and Tamura, Koichi, to Tokico Ltd. Disc brake. 4,360,081, Cl. 188-73.380.
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Haraikawa, Tetsuo; Ito, Hiroshi; and Tamura, Koichi, 4,360,082, Cl. 188-73.450.
Ito, Kenzo: *See*—
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Ito, Masahiro: *See*—
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Itoh, Kunio: *See*—
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ITT Industries, Inc.: *See*—
Belart, Juan, 4,360,079, Cl. 188-73.340.
Iwamoto, Akito; and Sekizawa, Hidekazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for inspecting defects in a periodic pattern. 4,360,269, Cl. 356-239.000.
Iwaya, Shoichi: *See*—
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Parquet, Donald J., 4,360,074, Cl. 180-287.000.
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Ortner, Herbert; Pfalzer, Lother; and Fischer, Siegbert, 4,360,402, Cl. 162-5.000.
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Jack, James M., to Northern Vibrator Manufacturing Ltd. Method and apparatus for creating a path through particulate material. 4,360,276, Cl. 366-101.000.
Jackson, Andrew. Placement device for golf tee and ball. 4,360,199, Cl. 273-32.500.
Jackson, Winston J., Jr.; and Darnell, William R., to Eastman Kodak Company. Process for the preparation of polyesters and poly(ester-carbonates). 4,360,648, Cl. 525-462.000.
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Jacob, Lothar: *See*—
Kopnick, Siegfried; Huthwelker, Dirk; Franz, Arnold; and Jacob, Lothar, 4,360,560, Cl. 428-236.000.
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Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, to Bayer Aktiengesellschaft. Combating fungi with 1-azolyl-1-propen-3-ols. 4,360,528, Cl. 424-269.000.
Jain, Nirmal S.: *See*—
Loeffler, Otto E.; Jain, Nirmal S.; and Kauder, Otto S., 4,360,542, Cl. 427-75.000.
Jamison, Thomas D.; and Radcliff, Frank T., to Electric Power Research Institute, Inc. Reel assembly for flexible tubing and the like. 4,360,715, Cl. 191-12.20R.
JanBen, Harald; and Hansch, Ferdinand, to Dr. Beck & Co. AG. Method of insulating an electrical conductor. 4,360,543, Cl. 427-120.000.
Janssens, Wilhelmus: *See*—
Odenwalder, Heinrich; Vetter, Hans; Janssens, Wilhelmus; and Jaeken, Jan, 4,360,581, Cl. 430-218.000.
Janusch, Alois, to Voest-Alpine Aktiengesellschaft. Process for hot briquetting of organic solid materials. 4,360,487, Cl. 264-101.000.
Jarnestedt, Goran A.: *See*—
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Jeandal: *See*—
Bruneau, Alain, 4,360,180, Cl. 248-162.100.
Jeck, Richard K. Calibration and testing device for optical, single particle, size spectrometers. 4,360,270, Cl. 356-243.000.
Jenison, Andrew: *See*—
Jenison, Eugene; and Jenison, Andrew, 4,360,065, Cl. 172-119.000.
Jenison, Eugene; and Jenison, Andrew. Cultivator for high efficiency windrow disintegration and aeration, row forming, and the like. 4,360,065, Cl. 172-119.000.
Jenkins, Arden F.: *See*—
Alsup, J. Douglas, Jr.; and Jenkins, Arden F., 4,360,281, Cl. 403-4.000.
Jennings, John D.; Killerby, Walter E.; and Reynolds, Robert L., to Western Electric Company, Inc. Separable multi-unit crystal network device. 4,360,792, Cl. 333-189.000.
Jeppsson, Hakan E. O. Valves. 4,360,039, Cl. 137-614.190.
Jette, Emile. Showerhead control adapter. 4,360,160, Cl. 239-289.000.
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Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, to Kumiai Chemical Industry Co., Ltd. Phenoxyphenoxy unsaturated derivatives and herbicidal composition. 4,360,375, Cl. 71-88.000.
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JLG Industries: *See*—
Abbott, Thomas C., 4,360,077, Cl. 182-2.000.
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Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, 4,360,605, Cl. 523-116.000.
Joel, Soumagne. Echo detector particularly for speech interpolation communication systems. 4,360,713, Cl. 179-170.200.
John Fluke Mfg. Co., Inc.: *See*—
Brodie, Benjamin T.; and Koeman, Henriecus, 4,360,880, Cl. 364-483.000.
Erps, Floyd D.; and Fried, Raymond L., 4,360,788, Cl. 331-1.00A.
John Wyeth & Brother Limited: *See*—
White, Alan C.; and Edington, Edwin T., 4,360,519, Cl. 424-248.550.
Johns Hopkins University, The: *See*—
Small, Thomas R., 4,359,912, Cl. 74-572.000.
Johnson, George E.; and Newman, Walter, to Leviton Manufacturing Co., Inc. Threaded lamp adapter. 4,360,243, Cl. 339-154.00L.
Johnson, Hugh G.; and Trattner, Burton C. Self-contained hand held portable lantern-flashlight consisting of a manually operated generator and rechargeable batteries. 4,360,860, Cl. 362-192.000.
Johnson & Johnson: *See*—
Ramsey, Maynard, III, 4,360,029, Cl. 128-681.000.
Rovee, David T.; Marvel, John R.; and Mezick, James A., 4,360,518, Cl. 424-240.000.
Johnson & Johnson Products, Inc.: *See*—
Buck, Carl J., 4,360,513, Cl. 424-56.000.
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Vidra, James D., 4,360,512, Cl. 424-56.000.
Johnson, Mark S.: *See*—
Ahlstrom, Ross C., Jr.; Johnson, Mark S.; Moore, Jerry P.; and Schoppe, Ivo R., Jr., 4,359,891, Cl. 73-23.100.
Johnson, Richard E., to Beloit Corporation. Air knife coater with pivoted lip. 4,359,964, Cl. 118-63.000.
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Johnston, Howard, to Dow Chemical Company, The. Ethers of 6-halo-4-halomethylpyridines and their fungicidal compositions and use. 4,360,524, Cl. 424-263.000.
Jojoba Growers & Processors Inc.: *See*—
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Jones, Howard T.: *See*—
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Jorgenson, Gary W.: *See*—
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Joseph, Joel R.; and Bleeke, William F., to CTS Corporation. Digitally driven combination coils for electrodynamic acoustic transducers. 4,360,707, Cl. 179-1.00A.
Joseph, Joseph P.: *See*—
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Logothetis, Emanuel N., 4,360,108, Cl. 209-598.000.
Judy, Paul E.; and Hoffman, John A., to Paul Judy & Associates. Knock-down pallet and stringer attaching mechanism. 4,359,948, Cl. 108-56.100.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich, 4,359,802, Cl. 16-238.000.
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Buschmann, Ernst; Schirmer, Ulrich; Zeeh, Bernd; Sauter, Hubert; and Jung, Johann, 4,360,465, Cl. 548-568.000.
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Kabel-und Metallwerke Gutehoffnungshutte AG: *See*—
Madry, Peter, 4,360,704, Cl. 174-36.000.
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Schleese, Eckard; Gunther, Wolf; and Buddensiek, Willi, 4,359,860, Cl. 57-293.000.
Kabushiki Kaisha Sato Kenkyusho: *See*—
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Nishimura, Haruo; Nakaya, Masaaki; Nakano, Katsuji; Matsuda, Noboru; and Matsumoto, Noriyuki, 4,360,130, Cl. 222-153.000.
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Kamio, Kunimasa; Okuno, Koichi; Haraguchi, Satoru; Yamaguchi, Hiroyuki; and Ohashi, Koichi, to Sumitomo Chemical Company, Limited. Curable composition. 4,360,649, Cl. 525-484.000.
Kamphues, Hermann, to C. Keller GmbH und Co, KG. Apparatus for setting formed articles. 4,360,100, Cl. 198-458.000.
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. High compression type internal combustion engine. 4,359,981, Cl. 123-263.000.
Kanno, Nobuyuki: *See*—
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Kanojia, Ramesh M., to Ortho Pharmaceutical Corporation. Process for preparing 8-oxabicyclo[3.2.1]-octane-1-acetic acids. 4,360,467, Cl. 549-397.000.
Kaplan, Leonard; and Bergman, Robert G., to Union Carbide Corporation. Process for producing ethylene glycol and methanol. 4,360,600, Cl. 518-700.000.
Kaplan, Murray A.; Bouzard, Daniel; Perol, Claude; Stemer, Jacques; and Weber, Abraham, to Bristol-Myers Company. Pharmaceutical formulations of 4'-(9-acridinylamino)-methanesulfon-m-anisidide. 4,360,523, Cl. 424-257.000.
Karl Lautenschlager KG, Mobelbeschlagfabrik: *See*—
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Karr, Robert J. Golf ball storage and feeder device. 4,360,204, Cl. 273-201.000.
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Kassabian, Levon. Cotton candy manufacturing apparatus. 4,360,328, Cl. 425-9.000.
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Katchka, Jay R., to Robertshaw Controls Company. Control system for dual coil pilot valve burner system. 4,360,338, Cl. 431-46.000.
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Kaufman, Frank B.: *See*—
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Kaufman, Vernon R., to Tecumseh Products Company. Fuel supply metering arrangement. 4,360,481, Cl. 261-39.00R.
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Kawaguchi, Takeyuki; Minematsu, Hiroyoshi; Hayashi, Yuzuru; Hara, Shigeyoshi; and Ueda, Fumio, to Teijin Limited. Amphoteric ion-permeable composite membrane. 4,360,434, Cl. 210-500.200.
Kawamura, Masanori: *See*—
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Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Method and apparatus for transmission of information in a photographic camera. 4,360,255, Cl. 354-23.00D.
Kawolics, Raymond P.: *See*—
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Keeler, Andrew L.; and Marsico, Ronald. Grouted strand anchor and method of making same. 4,360,292, Cl. 405-244.000.
Kellar, Paul R. N., to Quantel Limited. Multiple image digital processing system. 4,360,831, Cl. 358-182.000.
Kelly, John W., to Haskel Engineering & Supply Company. Self-centering seal for use in hydraulically expanding tubes. 4,359,889, Cl. 72-62.000.
Kelly, Joseph D.: *See*—
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Swart, Daniel J.; and Kelyman, Jacqueline S., 4,360,656, Cl. 528-176.000.
Kendall, Giles A., to Anthony Manufacturing Corp. Self-cleaning filter assembly for solenoid-actuated valve. 4,360,037, Cl. 137-242.000.
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Weber, James H., 4,360,297, Cl. 407-113.000.
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Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,360,234, Cl. 299-5.000.
Kensrue, Milo M. Holder for welding seam back-up tape. 4,360,141, Cl. 228-46.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
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Keuning, Roelof; Haighton, Adolf J.; Dijkshoorn, Willem; and Huizinga, Hindrik, to Lever Brothers Company. Process for the dry fractionation of oils and fats having a steep dilatation/temperature line and use of the fractionated fats in margarines and shortenings. 4,360,536, Cl. 426-603.000.
KEURO Maschinenbau GmbH & Co. KG: *See*—
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KEURO Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft: *See*—
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Kiefer, Gunther, to Adolf Illig GmbH & Co. Thermoforming machine. 4,360,334, Cl. 425-387.100.
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Kieronski, John P., to Terrell Machine Company, The. Filtering apparatus having inlet vanes for preventing accumulation of particulates. 4,360,432, Cl. 210-402.000.
Kilgore, Marion D., to Otis Engineering Corporation. Valve. 4,360,063, Cl. 166-317.000.
Killerby, Walter E.: *See*—
Jennings, John D.; Killerby, Walter E.; and Reynolds, Robert L., 4,360,792, Cl. 333-189.000.
Kim, Tai K.: *See*—
MacInnis, Martin B.; McClintic, Robert P.; and Kim, Tai K., 4,360,502, Cl. 423-54.000.
Kimchi, Yigal: *See*—
Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, 4,359,878, Cl. 62-476.000.
Kimura, Ichiro: *See*—
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,360,375, Cl. 71-88.000.
Kimura, Osamu; Kojima, Takashi; Okino, Eizo; and Nagasaki, Hideo, to Sumitomo Chemical Company, Limited. Low viscous p-phenylene diamine stabilizers. 4,360,621, Cl. 524-255.000.
Kinbara, Hiroji: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,360,353, Cl. 474-12.000.
Kinch, Michael A.: *See*—
Chapman, Richard A.; Lewis, Adam J., Jr.; Hynecek, Jaroslav; and Kinch, Michael A., 4,360,732, Cl. 250-332.000.
King, Alicia P.: *See*—
Krespan, Carl G.; and King, Alicia P., 4,360,645, Cl. 525-403.000.
Kingsdown Medical Consultants, Ltd.: *See*—
Edwards, John V., 4,360,025, Cl. 604-180.000.
Kinney, Frank N. Refuse collection device. 4,360,229, Cl. 294-1.0BA.
Kinnunen, Paavo K. J.; Schroder, Tom M.; and Virtanen, Jorma A., to KSV-Chemicals Oy. Process for preparing 1,2-diacyl-sn-glycerols. 4,360,694, Cl. 560-263.000.
Kinoshita, Takao; Shinoda, Nobuhiko; and Sakai, Shinji, to Canon Kabushiki Kaisha. Light sensitive semi-conductor element and arrangement. 4,360,833, Cl. 358-213.000.
Kirchoff, George F., to Thiokol Corporation. Low mount, easily assembled, air bag passive restraint module. 4,360,223, Cl. 280-729.000.
Kirkland, James C., Jr., to Kirkland, James C., Jr. System for preparing hot vaporized fuel for use in internal combustion engine. 4,359,996, Cl. 123-557.000.
Kirkland, John R.: *See*—
Sachtleben, Sandra G.; and Kirkland, John R., 4,360,539, Cl. 427-8.000.
Kirst, Herbert A., to Eli Lilly and Company. 4''-N-(Substituted)-apramycin antibiotic derivatives and intermediates therefor. 4,360,665, Cl. 536-16.800.
Kitano, Junjiro: *See*—
Hamazato, Kazuo; Kitano, Junjiro; and Takeshita, Tetsuo, 4,360,709, Cl. 179-18.0FA.
Kitano, Shigeru: *See*—
Onishi, Soichi; and Kitano, Shigeru, 4,360,842, Cl. 360-25.000.
Kiwala, Jacob: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,360,032, Cl. 131-276.000.
Kizer, Richard W.: *See*—
Stevens, Samuel B.; and Kizer, Richard W., 4,360,169, Cl. 242-4.0BE.
Kizler, Alfred; and Schirmer, Gunter, to Robert Bosch GmbH. Voltage source for ion current measurement in an internal combustion engine. 4,359,893, Cl. 73-115.000.
Kleebaur, Karl: *See*—
Neumann, Karl-Heinz; Hagenlocher, Walter; Kleebaur, Karl; and Christ, Klaus H., 4,360,749, Cl. 310-42.000.
Kleemann, Axel; Nygren, Robert; and Wagner, Rudolf, to Degussa Aktiengesellschaft. Process for the production of 1-amino-propanediol-2,3. 4,360,697, Cl. 564-475.000.
Klenk, Herbert; Wirthwein, Rolf; Waldmann, Helmut; and Seifert, Hermann, to Deutsche Gold- und Silberscheideanstalt vormals Roessler; and Bayer Aktiengesellschaft. Stabilizing caprolactones with dihydroxybenzenes. 4,360,682, Cl. 549-266.000.
Klett, Keith K.: *See*—
Howard, Velmar E.; Klett, Keith K.; Sammann, Ernest A.; and Verdeyen, Joseph T., 4,360,850, Cl. 361-56.000.
Kloeckner-Werke AG: *See*—
Kost, Friedrich-Wilhelm, 4,360,310, Cl. 414-684.300.
Klootwyk, Ronald I., to Continental Group, Inc., The. Rib-grid cathode. 4,360,577, Cl. 429-209.000.
Klose, Peter; and Ovshinsky, Herbert, to Energy Conversion Devices, Inc. Apparatus for preventing fogging of intermediate film in microfiche recording systems. 4,360,579, Cl. 430-8.000.
Knaus, Ernest; Namsick, Raymond J.; and Smith, Herbert D., to Goodyear Aerospace Corporation. Fabric-reinforced, flexible-walled container and method of making said container. 4,360,124, Cl. 220-452.000.
Knops, Hans-Joachim: *See*—
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,360,529, Cl. 424-269.000.
Kobayashi, Hiromitsu: *See*—
Maruyama, Eisuke; Kobayashi, Hiromitsu; Mitsuhashi, Masakazu; Takeuchi, Hiromichi; Futamura, Yoshiki; and Suzuki, Naohito, 4,360,127, Cl. 222-14.000.
Kobishi Electric Co., Ltd.: *See*—
Ishii, Tadashi, 4,360,800, Cl. 340-396.000.
Koch, Gerhard, to Hafele KG. Fitting for connecting two vertically abutting bodies of furniture. 4,360,282, Cl. 403-19.000.
Kodama, Kazuyuki: *See*—
Okada, Kunihiro; Endo, Takeyuki; Yabuuchi, Shigeru; Funo, Takakazu; Kodama, Kazuyuki; and Shibuya, Yasutaka, 4,360,884, Cl. 364-521.000.

Koeman, Henriecus: *See*—
Brodie, Benjamin T.; and Koeman, Henriecus, 4,360,880, Cl. 364-483.000.
Koestler, Robert C., to Pennwalt Corporation. Microencapsulated trifluralin. 4,360,376, Cl. 71-121.000.
Koga, Hideaki: *See*—
Numazawa, Akio; Koga, Hideaki; and Suzuki, Satomi, 4,359,910, Cl. 74-476.000.
Kohl, Arthur L., to Rockwell International Corporation. Filtering method and apparatus therefor. 4,360,364, Cl. 55-96.000.
Kohno, Mitsuo: *See*—
Taguchi, Tadashi; Fujikawa, Noboru; Kohno, Mitsuo; Yoshitake, Katsumi; and Satake, Kunio, 4,360,582, Cl. 430-260.000.
Kohyama, Mitsuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Exposure apparatus for copying machines. 4,360,261, Cl. 355-3.00R.
Koike, Masao: *See*—
Tarutani, Yoshio; Moroishi, Taishi; and Koike, Masao, 4,360,381, Cl. 75-126.00F.
Koike, Norio: *See*—
Tsukada, Toshihisa; Maruyama, Eiichi; Baji, Toru; Ataka, Saburo; Imamura, Yoshinori; Sasano, Akira; Kubo, Masaharu; Koike, Norio; and Nagahara, Shusaku, 4,360,821, Cl. 357-31.000.
Kojima, Takashi: *See*—
Kimura, Osamu; Kojima, Takashi; Okino, Eizo; and Nagasaki, Hideo, 4,360,621, Cl. 524-255.000.
Kojima, Tetsuro; Morigaki, Masakazu; Hamaoka, Tsutomu; and Sawada, Satoru, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive materials. 4,360,589, Cl. 430-551.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Mizuguchi, Yoshihiko; and Akagawa, Masataka, 4,360,815, Cl. 343-781.00P.
Kolc, Jaroslav: *See*—
Denkewalter, Robert G.; Kolc, Jaroslav; and Lukasavage, William J., 4,360,646, Cl. 525-420.000.
Kollmorgen Technologies Corporation: *See*—
Arnold, Frank, Jr.; and Geiger, Dana F., 4,360,751, Cl. 310-60.00R.
Kollross, Gunter. Apparatus for axial shirring of plastic tubular material, especially artificial casing for sausage manufacture. 4,359,806, Cl. 17-1.00R.
Kolodziejczyk, John P. Power chain saw handle attachment. 4,359,822, Cl. 30-296.00R.
Koltz, Irving M. Open top set up container. 4,360,146, Cl. 229-24.000.
Koncelik, Joseph A.; Chaney, David B.; and Lockard, Walter G., to Burlington Industries, Inc. Modular storage units. 4,360,240, Cl. 312-238.000.
Konishi, Masataka; Miyaki, Takeo; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, to Bristol-Myers Company. Process of producing a peptide antibiotic with *Bacillus circulans*. 4,360,593, Cl. 435-70.000.
Konrath, Karl: *See*—
Hofer, Gerald; Konrath, Karl; and Laufer, Helmut, 4,359,994, Cl. 123-502.000.
Kopnick, Siegfried; Huthwelker, Dirk; Franz, Arnold; and Jacob, Lothar, to Dynamit Nobel Aktiengesellschaft. Base material for the production of printed circuits and process for the preparation of the base material. 4,360,560, Cl. 428-236.000.
Kopp, Richard: *See*—
Grogler, Gerhard; Rasshofer, Werner; and Kopp, Richard, 4,360,603, Cl. 521-159.000.
Koppers Company, Inc.: *See*—
Kozy, Michael J., 4,360,404, Cl. 202-263.000.
Korea Institute of Science and Technology: *See*—
Park, Young W., 4,360,574, Cl. 429-94.000.
Koren, Edward F. Printing roller for removing hickeys. 4,359,938, Cl. 101-148.000.
Kornrumpf, William P.: *See*—
Bloomer, Milton D.; Ciccone, Joseph L.; Harnden, John D., Jr.; Kornrumpf, William P.; and Shattuck, Donald P., 4,360,847, Cl. 361-3.000.
Koshin Seimitsu Kikai Kabushiki Kaisha: *See*—
Hida, Kazuo, 4,359,955, Cl. 112-240.000.
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, to Bristol-Myers Company. Antitumor antibacterial agents. 4,360,458, Cl. 260-112.50R.
Kost, Friedrich-Wilhelm, to Kloeckner-Werke AG. Arrangement for positioning a device for closing and opening pressure vessels. 4,360,310, Cl. 414-684.300.
Kostas, Evans; Crum, Gerald W.; and Walker, Jerome F., to Nordson Corporation. Method and apparatus for analyzing the feasibility of performing a programmed sequence of motions with a robot. 4,360,886, Cl. 364-551.000.
Kotani, Motoharu: *See*—
Usami, Akira; Kotani, Motoharu; and Goda, Tomoko, 4,360,022, Cl. 128-290.00R.
Koump, Valentin, to Westinghouse Electric Corp. High temperature abrasive resistant heat exchanger. 4,360,057, Cl. 165-82.000.
Koval, Timothy D., to Solarex Corporation. Vapor deposition of H_3PO_4 and formation of thin phosphorus layer on silicon substrates. 4,360,393, Cl. 148-171.000.
Kozy, Michael J., to Koppers Company, Inc. Apparatus for control of coke oven emissions. 4,360,404, Cl. 202-263.000.
Kraatz, Udo: *See*—
Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,360,528, Cl. 424-269.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Marker, Wolfgang; Muller, Klaus; and Roller, Wilhelm, 4,360,496, Cl. 376-298.000.
Kramer, Manfred, to Robert Bosch GmbH. Control apparatus for internal combustion engines, in particular a correction device dependent on charge pressure for super-charged diesel vehicle engines. 4,359,986, Cl. 123-383.000.
Kramer, Steven R.: *See*—
Engler, Edward M.; Kaufman, Frank B.; Kramer, Steven R.; and Scott, Bruce A., 4,360,583, Cl. 430-270.000.
Kramer, Vance M., Jr.: *See*—
Kramer, Vance M., Sr.; and Kramer, Vance M., Jr., 4,360,493, Cl. 264-506.000.
Kramer, Vance M., Sr.; and Kramer, Vance M., Jr. Flexible corrugated rubber tubing of dual composition. 4,360,493, Cl. 264-506.000.
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Combating fungi with trisubstituted benzyl oxime ethers. 4,360,529, Cl. 424-269.000.
Kratzer, Hans: *See*—
Findeisen, Kurt; Kratzer, Hans; and Lenthe, Manfred, 4,360,479, Cl. 260-545.00R.
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, to A.T. Ramot Plastics Ltd. Aromatic diamino phosphoramides, thiophosphoramides and phosphoramidates. 4,360,480, Cl. 260-944.000.
Kreidler, James F.; Neuber, Ralph E.; and Swank, Harry R., to North American Philips Consumer Electronics Corp. Cathode ray tube support system. 4,360,837, Cl. 358-246.000.
Krespan, Carl G.; and King, Alicia P., to Du Pont de Nemours, E. I., and Company. Perfluoroglycidyl ethers. 4,360,645, Cl. 525-403.000.
Kress, Jack L.: *See*—
Adkison, Frank L.; and Kress, Jack L., 4,359,807, Cl. 17-1.00R.
Kromer, Gunter; Bauder, Armin; and Maurhoff, Gerhard, to Audi NSU Auto Union Aktiengesellschaft. Fuel injection system. 4,359,990, Cl. 123-453.000.
Kroy Inc.: *See*—
Paque, Michael W., 4,360,278, Cl. 400-134.300.
Krutchen, Charles M.: *See*—
DiBiasi, Daniel J.; and Krutchen, Charles M., 4,360,486, Cl. 264-37.000.
KSV-Chemicals Oy: *See*—
Kinnunen, Paavo K. J.; Schroder, Tom M.; and Virtanen, Jorma A., 4,360,694, Cl. 560-263.000.
Kubach, Hans: *See*—
Stumpp, Gerhard; Walz, Ludwig; Schielinsky, Gerhard; Wessel, Wolf; Kuttner, Thomas; Flaig, Ulrich; Piwonka, Fridolin; Eisele, Hermann; Boehringer, Andreas; Kubach, Hans; Locher, Johannes; and Becker, Waldemar, 4,359,991, Cl. 123-478.000.
Kubo, Masaharu: *See*—
Tsukada, Toshihisa; Maruyama, Eiichi; Baji, Toru; Ataka, Saburo; Imamura, Yoshinori; Sasano, Akira; Kubo, Masaharu; Koike, Norio; and Nagahara, Shusaku, 4,360,821, Cl. 357-31.000.
Kubota, Ltd.: *See*—
Sada, Kenzo; and Watashi, Mitsuo, 4,360,091, Cl. 192-4.00B.
Kubota, Yutaka; and Sugimoto, Hitoshi, to Diesel Kiki Kabushiki Kaisha. Control circuit for a glow plug assembly serving as an engine preheating means. 4,360,765, Cl. 315-209.00M.
Kuge, Tsukasa: *See*—
Saito, Takashi; Shigenobu, Michio; Kuge, Tsukasa; Sakurai, Masaaki; and Adachi, Hiroyuki, 4,359,963, Cl. 118-60.000.
Kugele, Thomas G.; Mesch, Keith A.; and Wursthorn, Karl R., to Carstab Corporation. Stabilizer compositions and polymers containing same. 4,360,619, Cl. 524-181.000.
Kuhfuss, Herbert F.: *See*—
Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,360,658, Cl. 528-193.000.
Kuhlmann, Robert: *See*—
Nauroth, Peter; Kuhlmann, Robert; Turk, Gunther; Bode, Rudolf; and Reisert, Arthur, 4,360,388, Cl. 106-288.00B.
Kuklies, Milton C.; and Reimann, George J., to Mobil Oil Corporation. Roll winder for large diameter rolls. 4,360,170, Cl. 242-56.00R.
Kulakov, Nikolai K.: *See*—
Silka, Adolf N.; Minasov, Alexandr N.; Kulakov, Nikolai K.; Likhogub, Evgeny P.; Dorfman, Gersh A.; Azimov, Alexandr A.; Davydenko, Vladimir M.; Marapulets, Gennady N.; Shestakov, Valentin A.; and Gromov, Nikolai F., 4,360,403, Cl. 202-263.000.
Kulkarny, Vijay A., to United States of America, Energy. Pressure wave charged repetitively pulsed gas laser. 4,360,922, Cl. 372-59.000.
Kumiai Chemical Industry Co., Ltd.: *See*—
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,360,375, Cl. 71-88.000.
Kummer, Rudolf; and Schneider, Heinz-Walter, to BASF Aktiengesellschaft. Preparation of formylvalerates. 4,360,692, Cl. 560-175.000.
Kuper, Douglas D.: *See*—
Menezes, William A.; Kuper, Douglas D.; and Wheeler, David, 4,360,843, Cl. 360-72.200.
Kurahashi, Kazuo: *See*—
Iijima, Kenzaburo; Kurahashi, Kazuo; and Hoshi, Toshiharu, 4,360,382, Cl. 75-200.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Asano, Kiro; Tamura, Humio; Tanaka, Hiromitsu; and Enomoto, Satoru, 4,360,663, Cl. 536-5.000.
Endo, Yasushi; and Suzuki, Seiichi, 4,360,562, Cl. 428-317.700.

Kurei, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Resetting apparatus for single lens reflex photographic camera. 4,360,257, Cl. 354-36.000.

Kurlander, Susan L.: *See*—
Hoffman, Louis S.; and Kurlander, Susan L., 4,359,852, Cl. 53-420.000.

Kurose, Morisumi: *See*—
Ejiri, Koichi; Kurose, Morisumi; and Hayakawa, Seiji, 4,360,883, Cl. 364-515.000.

Kurotori, Tsuneo: *See*—
Tsubuko, Kazuo; Matsubayashi, Kenichi; and Kurotori, Tsuneo, 4,360,580, Cl. 430-137.000.

Kurtz, Larry E. Device for supporting wearing apparel. 4,360,109, Cl. 211-100.000.

Kurtz, Stuart J., to Union Carbide Corporation. Process for reducing melt fracture during extrusion of a molten narrow molecular weight distribution, linear, ethylene copolymer. 4,360,494, Cl. 264-564.000.

Kustedjo, Simon; and Mak, Kuen H., to NCR Canada Ltd.-NCR Canada Ltee. Method and apparatus for providing for two bits-error detection and correction. 4,360,916, Cl. 371-37.000.

Kuttner, Thomas: *See*—
Stumpp, Gerhard; Walz, Ludwig; Schielinsky, Gerhard; Wessel, Wolf; Kuttner, Thomas; Flaig, Ulrich; Piwonka, Fridolin; Eisele, Hermann; Boehringer, Andreas; Kubach, Hans; Locher, Johannes; and Becker, Waldemar, 4,359,991, Cl. 123-478.000.

Kyushu Hitachi Maxell, Ltd.: *See*—
Shitama, Katuaki, 4,360,906, Cl. 369-72.000.

Ladet, Michel; Lefevre, Jacques; and Patrie, Jos, to Societe de Vente de l'Aluminium Pechiney. Aluminum electrical contacts and method of making same. 4,360,411, Cl. 204-33.000.

Lamarche, Paul E., to Borg-Warner Corporation. Extended travel vibration damper assembly. 4,360,352, Cl. 464-64.000.

Landheer, Hugo A. J., to Hunter Douglas International N.V. Sandwich panel. 4,360,553, Cl. 428-45.000.

Landt, Jeremy A., to United States of America, Energy. Multichannel homodyne receiver. 4,360,810, Cl. 343-6.50R.

Lane, James L.: *See*—
Hoggard, Julius M.; and Lane, James L., 4,359,844, Cl. 52-101.000.

Lane, Parley C., Jr.: *See*—
Wootton, Gerald V.; Lane, Parley C., Jr.; and Yi, Kong S., 4,360,629, Cl. 524-553.000.

Lanfranconi, Gianmario; and Vecellio, Bernardino, to Industrie Pirelli S.p.A. Electric cables of reduced micro-voids in the extruded insulation. 4,360,706, Cl. 174-105.0SC.

Lang, Volker. Universal sterile closed hose system for respiration therapy apparatus. 4,360,104, Cl. 206-527.000.

Langer, Horst G.: *See*—
Brady, Thomas P.; and Langer, Horst G., 4,360,474, Cl. 260-429.500.

Langston, Earl M.; Moore, Charles W.; Malecki, Richard L.; and Bruot, Roger C., to Tokheim Corporation. Distributed data processing system and method for a fluid dispenser. 4,360,877, Cl. 364-465.000.

Larson, Daniel A.: *See*—
Thornton, William A., Jr.; Larson, Daniel A.; and Chen, Edward, 4,360,758, Cl. 313-227.000.

Larsson, Ralf, to Ide-Produktion Ralf Larsson. Device for vertical and/or horizontal transport of loads into and out of a vehicle or the like. 4,360,307, Cl. 414-342.000.

Larsson, Rolf E.; and Eriksson, Erik E. Device for forming corner joints of wall elements. 4,360,287, Cl. 403-219.000.

Laufer, Helmut: *See*—
Hofer, Gerald; Konrath, Karl; and Laufer, Helmut, 4,359,994, Cl. 123-502.000.

Lautenschlager, Karl, to Karl Lautenschlager KG, Mobelbeschlagfabrik. Hinge for cabinet door mirror. 4,359,803, Cl. 16-272.000.

Lawless, James C. Liquid level gauge. 4,359,902, Cl. 73-290.00R.

Lawrence Brothers, Inc.: *See*—
McNinch, Delmar, 4,359,804, Cl. 16-276.000.

Lawson, James L.: *See*—
Duncan, James P.; and Lawson, James L., 4,360,189, Cl. 266-118.000.

Leal, Joaquin: *See*—
Gifford, John F.; Sliger, Edward; and Leal, Joaquin, 4,360,308, Cl. 414-572.000.

LeBlanc, Destin A., to Harshaw Chemical Company, The. Colloidal aqueous dispersion of an alkali metal polyantimonate and a process of making said. 4,360,450, Cl. 252-313.00R.

Lee, Len F.: *See*—
Howe, Robert K.; and Lee, Len F., 4,360,678, Cl. 548-236.000.

Lee, Raymond: *See*—
Gagliani, John; Lee, Raymond; and Sorathia, Usman A. K., 4,360,604, Cl. 521-189.000.

Lee, Robert T. Y., to Beckman Instruments, Inc. Creatine kinase isoenzyme electrophoretic technique and improved creatine kinase isoenzyme reagent for use therein. 4,360,413, Cl. 204-180.00G.

Lefevre, Jacques: *See*—
Ladet, Michel; Lefevre, Jacques; and Patrie, Jos, 4,360,411, Cl. 204-33.000.

Leffler, Nils; and Kaski, Kalevi, to Measurex Corporation. Method for maximizing the reduction efficiency of a recovery boiler. 4,359,950, Cl. 110-188.000.

Lehmann, Jerry H.: *See*—
Nyman, Bengt E.; and Lehmann, Jerry H., 4,360,254, Cl. 352-166.000.

Lehmann, Roger, to Societe Anonyme dite, Compagnie Generale d'Automatise. Payment voucher. 4,360,727, Cl. 235-441.000.

Lehovec, Kurt, to University of Southern California. Memory cell comprising tunnel diodes and field effect transistors. 4,360,897, Cl. 365-159.000.

Leiber, Heinz: *See*—
Brammer, Hartmut; and Leiber, Heinz, 4,359,978, Cl. 123-146.50A.

Leiby, Douglas J.: *See*—
Davis, Newton G.; Leiby, Douglas J.; and Long, Alden O., Jr., 4,360,400, Cl. 156-468.000.

Leighty, Robert D.; and Lukes, George E. Hybrid optical-digital pattern recognition apparatus and method. 4,360,799, Cl. 340-146.30P.

Leininger, Lyle E.: *See*—
Streit, Philip N.; and Leininger, Lyle E., 4,360,046, Cl. 141-82.000.

Leising, Larry J.: *See*—
Tanguy, Denis R.; and Leising, Larry J., 4,359,898, Cl. 73-151.000.

Lemanski, Michael F.; Spitnale, Gregory G.; and Milberger, Ernest C., to Standard Oil Company, The. Preparation of vanadium phosphorus catalysts. 4,360,453, Cl. 252-435.000.

Lenthe, Manfred: *See*—
Findeisen, Kurt; Kratzer, Hans; and Lenthe, Manfred, 4,360,479, Cl. 260-545.00R.

Leo Gottwald KG: *See*—
Weiskopf, Hans, 4,360,111, Cl. 212-196.000.

Leopold, Howard S., to Leviton Manufacturing Co., Inc. Touch sensitive switch. 4,360,737, Cl. 307-116.000.

Leslie, Elmer N.: *See*—
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,359,953, Cl. 112-121.110.

L'Etat Francais represente por le Deleque Ministeriel pour l'Armement: *See*—
Tardot, Jacques, 4,360,117, Cl. 220-4.00R.

Leuschke, Christian: *See*—
Alberts, Heinrich; Fischer, Winfried; Leuschke, Christian; and Bartl, Herbert, 4,360,635, Cl. 525-54.450.

Leutner, Bernd: *See*—
Blanck, Klaus; Dethlefsen, Winfried; Jungbauer, Anton; Leutner, Bernd; Schier, Ernst-Juergen; Schlimper, Hans-Ulrich; and Schneehage, Hans H., 4,360,504, Cl. 423-236.000.

Lever Brothers Company: *See*—
Darling, Donald F.; and Dicks, Eric, 4,360,535, Cl. 426-570.000.
Keuning, Roelof; Haighton, Adolf J.; Dijkshoorn, Willem; and Huizinga, Hindrik, 4,360,536, Cl. 426-603.000.

Leviton Manufacturing Co., Inc.: *See*—
Johnson, George E.; and Newman, Walter, 4,360,243, Cl. 339-154.00L.
Leopold, Howard S., 4,360,737, Cl. 307-116.000.
Poliak, John M.; and Lopez, Juan M., 4,360,242, Cl. 339-99.00R.

Levy, Itshak; Ron, Samuel; Sahar, Abraham; and Wolowelsky, Jehoshua, to Yeda Research and Development Co., Ltd. Remote controlled magnetic actuator particularly for an implantable device like a valve. 4,360,007, Cl. 128-1.00R.

Levy, Louis L.: *See*—
Chua, David L.; Garoutte, Kurt F.; and Levy, Louis L., 4,360,572, Cl. 429-53.000.

Levy, Stephen, to United States of America, Army. Anode mounting for window type Geiger-Mueller tube. 4,360,755, Cl. 313-93.000.

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Wang, Samuel S.; and Lewellyn, Morris E., 4,360,615, Cl. 524-9.000.

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Bolin, James A., 4,360,231, Cl. 294-87.200.

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Noutko, Theodore E.; Toms, Steve D.; and Light, David P., 4,360,848, Cl. 361-15.000.

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Silka, Adolf N.; Minasov, Alexandr N.; Kulakov, Nikolai K.; Likhogub, Evgeny P.; Dorfman, Gersh A.; Azimov, Alexandr A.; Davydenko, Vladimir M.; Marapulets, Gennady N.; Shestakov, Valentin A.; and Gromov, Nikolai F., 4,360,403, Cl. 202-263.000.

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Asztalos, Stefan, 4,360,362, Cl. 55-21.000.
Strass, Wilfried, 4,359,871, Cl. 60-648.000.
Lindenschmidt, Gerhard; Schulte, Wolfgang; Brandstetter, Franz; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Preparation of mixtures of brominated polystyrenes and brominated aromatic compounds. 4,360,455, Cl. 252-609.000.
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Fraser, Graham, 4,359,809, Cl. 24-265.00C.
Lindstrom, Olle B. Direct reduction of iron oxide containing material with biofuel. 4,360,378, Cl. 75-34.000.
Liou, Shu-Lien. Disc type kitchen sink drain valve. 4,359,788, Cl. 4-287.000.
Little, Frank, to Harshaw Chemical Company, The. Self-unloading centrifuge. 4,360,431, Cl. 210-369.000.
Litton Systems Inc.: *See*—
Louderback, Anthony W., 4,360,275, Cl. 356-446.000.
Lo, Kun-Nan. CFRP or FRP made badminton racket frame. 4,360,202, Cl. 273-73.00F.
Loch, Charles H.: *See*—
Barnes, Jocelyn T.; Hard, Chester A., III; Shelby, Billy L.; and Loch, Charles H., 4,360,863, Cl. 362-346.000.
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Stumpp, Gerhard; Walz, Ludwig; Schielinsky, Gerhard; Wessel, Wolf; Kuttner, Thomas; Flaig, Ulrich; Piwonka, Fridolin; Eisele, Hermann; Boehringer, Andreas; Kubach, Hans; Locher, Johannes; and Becker, Waldemar, 4,359,991, Cl. 123-478.000.
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Koncelik, Joseph A.; Chaney, David B.; and Lockard, Walter G., 4,360,240, Cl. 312-238.000.
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Bridges, Thomas N., Sr., 4,359,965, Cl. 118-711.000.
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Eubanks, Kenneth B.; and Loeb, Clifford E., 4,359,911, Cl. 74-552.000.
Loeffler, Otto E.; Jain, Nirmal S.; and Kauder, Otto S., to Argus Chemical Corporation. Process for the preparation of thin films of cadmium sulfide and precursor solutions of cadmium ammonia thiocyanate complex useful therein. 4,360,542, Cl. 427-75.000.
Logothetis, Emanuel N., to Joule' Technical Corporation. Method and apparatus for checking letter thickness. 4,360,108, Cl. 209-598.000.
Loiseau, Roger, to Loiseau Semences. Apparatus for burning beard of seed. 4,359,839, Cl. 47-58.000.
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Loiseau, Roger, 4,359,839, Cl. 47-58.000.
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Davis, Newton G.; Leiby, Douglas J.; and Long, Alden O., Jr., 4,360,400, Cl. 156-468.000.
Lonseal Corporation: *See*—
Miura, Nobuo; and Akiba, Yuichi, 4,360,558, Cl. 428-159.000.
Lopez, Juan M.: *See*—
Poliak, John M.; and Lopez, Juan M., 4,360,242, Cl. 339-99.00R.
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Andreades, Sam; Beske, Grant A.; and Lott, John W., 4,360,570, Cl. 428-596.000.
Louderback, Anthony W., to Litton Systems Inc. Device for measurement of optical scattering. 4,360,275, Cl. 356-446.000.
Love, Richard F.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., to Texaco Inc. Catalyst for steam dehydrocyclization. 4,360,454, Cl. 252-465.000.
Lucas, Charles H.: *See*—
Lewyn, Lanny L.; and Lucas, Charles H., 4,360,789, Cl. 331-109.000.
Lucas, Gary M.: *See*—
Hallgren, John E.; and Lucas, Gary M., 4,360,477, Cl. 260-463.000.
Lucas Industries Limited: *See*—
Mowbray, Dorian F., 4,359,995, Cl. 123-502.000.
Lukasavage, William J.: *See*—
Denkewalter, Robert G.; Kolc, Jaroslav; and Lukasavage, William J., 4,360,646, Cl. 525-420.000.
Luker, Edward, to Sunbeam Plastics Corporation. Child resistant container and cap assembly. 4,360,113, Cl. 215-216.000.
Lukes, George E.: *See*—
Leighty, Robert D.; and Lukes, George E., 4,360,799, Cl. 340-146.30P.
Lummus Company, The: *See*—
Tsao, Utah, 4,360,405, Cl. 203-24.000.
Lund, Walter W., Jr.: *See*—
Fitzsimmons, George W.; Lund, Walter W., Jr.; and Nalos, Ervin J., 4,360,741, Cl. 307-151.000.
Luoma, Warren L.: *See*—
Emanuelson, Roger C.; Luoma, Warren L.; and Taylor, William A., 4,360,485, Cl. 264-29.500.
Lyle Development, Inc.: *See*—
Wendt, Michael, 4,360,139, Cl. 226-142.000.
Lyon, Roland. Air-conditioner employing the evaporation of water for a cab of a machine or vehicle. 4,360,368, Cl. 55-259.000.
Lyssy, Norbert G., to Vaughn, Harry D. Fixed blade turbulence generator. 4,359,997, Cl. 123-592.000.
Maas, Adrianus T.: *See*—
Abet, Hans-Guenter; and Maas, Adrianus T., 4,359,925, Cl. 86-43.000.
Macartney, Lawrence J.: *See*—
Vilagi, Burton J.; Scharf, Donald R.; and Macartney, Lawrence J., 4,360,132, Cl. 222-504.000.
Maciejko, Roman, to Northern Telecom Limited. Fiber optic element for reducing speckle noise. 4,360,372, Cl. 65-4.210.
MacInnis, Martin B.; McClintic, Robert P.; and Kim, Tai K., to GTE Products Corporation. Recovery of tungsten values from alkali tungstate solutions by solvent extraction. 4,360,502, Cl. 423-54.000.
Madry, Peter, to Kabel-und Metallwerke Gutehoffnungshutte AG. Moisture proof electrical cable. 4,360,704, Cl. 174-36.000.
Maeda, Yoshinobu; Taniguchi, Fumikazu; and Narikiyo, Kazuhiko, to Matsushita Electric Industrial Co., Ltd. Component lead wire cutting equipment. 4,360,043, Cl. 140-105.000.
Maehara, Toshifumi, to Akebono Brake Industry Co., Ltd. Deceleration sensing type fluid pressure control device for vehicle brake system. 4,360,237, Cl. 303-6.00C.
Magdo, Ingrid E.: *See*—
Abbas, Shakir A.; and Magdo, Ingrid E., 4,359,816, Cl. 29-571.000.
Magerlein, Barney J.; and Whaley, Howard A., to Upjohn Company, The. Antibiotic nodusmicin derivatives. 4,360,683, Cl. 549-266.000.
Magness, Howard A. Rail and post connector. 4,360,285, Cl. 403-187.000.
Magnussen, Peter; Schumacher, Volker; Gebert, Wolfgang; Reitz, Heinrich; and Praetorius, Werner, to BASF Aktiengesellschaft. Continuous preparation of adiptic acid. 4,360,695, Cl. 562-590.000.
Mahlke, David J., to AMSTED Industries Incorporated. Piston pin assembly. 4,359,913, Cl. 74-579.00E.
Maiers, Michael A., to Xerox Corporation. Head interlock mechanism. 4,360,844, Cl. 360-99.000.
Main, William E.; and McGinn, Michael, to Motorola, Inc. Linear full wave rectifier and method for providing full wave rectified signals. 4,360,866, Cl. 363-127.000.
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Maize-Tech, Inc.: *See*—
Bridgehouse, E. Scott; and Hawthorne, William M., 4,359,859, Cl. 57-200.000.
Majerus, John N., to United States of America, Army. Shaped charge warhead including shock wave forming surface. 4,359,943, Cl. 102-309.000.
Mak, Kuen H.: *See*—
Kustedjo, Simon; and Mak, Kuen H., 4,360,916, Cl. 371-37.000.
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Langston, Earl M.; Moore, Charles W.; Malecki, Richard L.; and Bruot, Roger C., 4,360,877, Cl. 364-465.000.
Maloney, Bernard A., to PPG Industries, Inc. Treatment of permionic membrane. 4,360,412, Cl. 204-98.000.
Maloney, Thomas M.; and Huffaker, E. Max, to Washington State University Research Foundation, Inc. Particleboard furnish blender. 4,360,545, Cl. 427-212.000.
Manahan, Virginia M. Restraining garment. 4,360,014, Cl. 128-134.000.
Mangin, Pierre: *See*—
Desvignes, Bernard; Bailly, Jean C.; and Mangin, Pierre, 4,360,650, Cl. 526-60.000.
Mangum-Sickles Industries, Inc.: *See*—
Nyman, Bengt E.; and Lehmann, Jerry H., 4,360,254, Cl. 352-166.000.
Mann, Fred W. Oscillating device for grain drills. 4,360,066, Cl. 172-130.000.
Mannesmann DeMag AG: *See*—
Dorsch, Georg, 4,360,305, Cl. 414-208.000.
Manning, William P.: *See*—
Ferrin, Charles R.; and Manning, William P., 4,360,363, Cl. 55-73.000.
Mantion, Richard; and Normandeau, Jean-Paul. Foldable traction-mat for motor vehicles. 4,360,153, Cl. 238-14.000.
Manwiller, Carl H., to Du Pont de Nemours, E. I., and Company. Oxidatively stable polyimide compositions. 4,360,626, Cl. 524-495.000.
Marantz, Laurence B.: *See*—
McArthur, Mary J.; Marantz, Laurence B.; and Scarbrough, Abb L., 4,360,507, Cl. 423-419.00P.
Marapulets, Gennady N.: *See*—
Silka, Adolf N.; Minasov, Alexandr N.; Kulakov, Nikolai K.; Likhogub, Evgeny P.; Dorfman, Gersh A.; Azimov, Alexandr A.; Davydenko, Vladimir M.; Marapulets, Gennady N.; Shestakov, Valentin A.; and Gromov, Nikolai F., 4,360,403, Cl. 202-263.000.
Marbach, Gerard, to Sevylor. Inflatable element and method of making same. 4,360,396, Cl. 156-70.000.
Marcellin, Georges: *See*—
Pascon, Claude; and Marcellin, Georges, 4,360,576, Cl. 429-143.000.
Maret, Jean-Claude, to Aciers et Outillage Peugeot. Transportable machine-tool. 4,360,047, Cl. 144-117.00R.
Marker, Wolfgang; Muller, Klaus; and Roller, Wilhelm, to Kraftwerk Union Aktiengesellschaft. Cooling system for auxiliary systems of a nuclear installation. 4,360,496, Cl. 376-298.000.
Marko, Ollie W., to Dow Corning Corporation. Siloxane crosslinkers. 4,360,687, Cl. 556-440.000.

Marlin Firearms Company, The: *See*—
Osborne, William E.; Burns, Arthur H., Jr.; and O'Keefe, James M., 4,359,810, Cl. 29-1.100.
Marschak, Howard J. Shelving assembly. 4,359,947, Cl. 108-1.000.
Marsico, Joseph W., Jr.: *See*—
Meyer, Walter E.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,360,466, Cl. 549-442.000.
Marsico, Ronald: *See*—
Keeler, Andrew L.; and Marsico, Ronald, 4,360,292, Cl. 405-244.000.
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., to Microdynamics, Inc. Control system for sewing machine. 4,359,953, Cl. 112-121.110.
Marten, Finn L.: *See*—
Pinschmidt, Robert K., Jr.; and Marten, Finn L., 4,360,632, Cl. 524-819.000.
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, to Abbott Laboratories. 2-O-Methanesulfonylfortimicin B. 4,360,668, Cl. 536-16.100.
Martin, Jerry R.: *See*—
Tadanier, John S.; Martin, Jerry R.; and Collum, Paulette, 4,360,666, Cl. 536-16.100.
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Martin, Pierre; and Bellus, Daniel, to Ciba-Geigy Corporation. 3,3,5-Trichloroglutaric acid imide. 4,360,676, Cl. 546-243.000.
Martin, Randall W.: *See*—
Ragland, Frank R., Jr.; and Martin, Randall W., 4,360,839, Cl. 358-249.000.
Martindale, Diane S.; and Hepp, Dennis G., to Medtronic, Inc. Medication inventory device. 4,360,125, Cl. 221-2.000.
Martinson, John R. Energy consumption control system and method. 4,360,881, Cl. 364-493.000.
Maruyama, Eiichi: *See*—
Tsukada, Toshihisa; Maruyama, Eiichi; Baji, Toru; Ataka, Saburo; Imamura, Yoshinori; Sasano, Akira; Kubo, Masaharu; Koike, Norio; and Nagahara, Shusaku, 4,360,821, Cl. 357-31.000.
Maruyama, Eisuke; Kobayashi, Hiromitsu; Mitsuhashi, Masakazu; Takeuchi, Hiromichi; Futamura, Yoshiki; and Suzuki, Naohito, to Tokico Ltd.; and Tokico Yuki Ltd. Apparatus for supplying fluid of predetermined quantity. 4,360,127, Cl. 222-14.000.
Marvel, John R.: *See*—
Rovee, David T.; Marvel, John R.; and Mezick, James A., 4,360,518, Cl. 424-240.000.
Marvin, Mark C. Elevated downhill transport system. 4,359,946, Cl. 104-93.000.
Marx, Jorg: *See*—
Haessner geb. Michael, Carmen; Mustroph, Heinz; and Marx, Jorg, 4,360,587, Cl. 430-332.000.
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., to Owens-Corning Fiberglas Corporation. Boron-modified asphalts. 4,360,473, Cl. 260-429.500.
Masaki, Kenji; Sone, Kohki; and Takase, Sadao, to Nissan Motor Co., Ltd. System for feedback control of air-fuel mixing ratio in intake system of internal combustion engine. 4,359,989, Cl. 123-438.000.
Mascioli, Rocco L.: *See*—
Bechara, Ibrahim S.; and Mascioli, Rocco L., 4,360,670, Cl. 544-64.000.
Mase, Syunzo: *See*—
Otagiri, Tadashi; Watanabe, Tetsuo; and Mase, Syunzo, 4,360,598, Cl. 501-103.000.
Massachusetts Institute of Technology: *See*—
Flanders, Dale C.; and Smith, Henry I., 4,360,586, Cl. 430-321.000.
Massmann, Volker: *See*—
Poetsch, Dieter; Becker, Werner; Radecke, Helmut; and Massmann, Volker, 4,360,830, Cl. 358-162.000.
Masuda, Isao: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Masuda, Isao; and Sato, Hideo, 4,360,824, Cl. 358-323.000.
Mats Olsson Konsult AB: *See*—
Olsson, Mats A.; and Sandstrom, Roland, 4,359,962, Cl. 116-137.00R.
Matsubara, Yuji, to Nissan Motor Company, Limited. Ignition timing regulating apparatus. 4,359,988, Cl. 123-424.000.
Matsubayashi, Kenichi: *See*—
Tsubuko, Kazuo; Matsubayashi, Kenichi; and Kurotori, Tsuneo, 4,360,580, Cl. 430-137.000.
Matsuda, Noboru: *See*—
Nishimura, Haruo; Nakaya, Masaaki; Nakano, Katsuji; Matsuda, Noboru; and Matsumoto, Noriyuki, 4,360,130, Cl. 222-153.000.
Matsui, Kazuma: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,360,353, Cl. 474-12.000.
Matsui, Takeshi; and Idogaki, Takaharu, to Nippon Soken, Inc. Electric actuator provided with a brake. 4,360,089, Cl. 192-2.000.
Matsumoto, Noriyuki: *See*—
Nishimura, Haruo; Nakaya, Masaaki; Nakano, Katsuji; Matsuda, Noboru; and Matsumoto, Noriyuki, 4,360,130, Cl. 222-153.000.
Matsumura, Hiroshi: *See*—
Ikeda, Minoru; Okada, Kazuya; Matsumura, Hiroshi; and Tachibata, Takeichi, 4,360,406, Cl. 203-32.000.
Matsushita Electric Corporation: *See*—
Rzeszewski, Theodore S., 4,360,832, Cl. 358-191.100.
Matsushita Electric Industrial Co., Ltd.: *See*—
Akiyama, Ryo; and Gotou, Makoto, 4,360,767, Cl. 318-318.000.
Isobe, Mitsuo, 4,360,929, Cl. 455-245.000.
Maeda, Yoshinobu; Taniguchi, Fumikazu; and Narikiyo, Kazuhiko, 4,360,043, Cl. 140-105.000.
Wada, Masaru; Shimizu, Hirokazu; Sugino, Takashi; and Itoh, Kunio, 4,360,920, Cl. 372-45.000.
Matthews, Gerald L.: *See*—
Baker, Philip G.; and Matthews, Gerald L., 4,360,264, Cl. 355-40.000.
Matui, Nobuo, to Fuji Photo Optical Co., Ltd. Television camera objective having driving mechanism for adjusting components of its optical system. 4,360,835, Cl. 358-225.000.
Matweyou, Stephen: *See*—
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,360,555, Cl. 428-107.000.
Mauduit, Daniel; and Sauron, Georges, to Commissariat a l'Energie Atomique. Machine for testing planar magnetic film with magnetic bubbles. 4,360,775, Cl. 324-210.000.
Mauer, Dieter, to USM Corporation. Method of fastening. 4,359,813, Cl. 29-469.500.
Maurhoff, Gerhard: *See*—
Kromer, Gunter; Bauder, Armin; and Maurhoff, Gerhard, 4,359,990, Cl. 123-453.000.
Maxwell, John M.: *See*—
Mellblom, Howard M.; and Maxwell, John M., 4,360,175, Cl. 244-115.000.
Mayer, Nathan, to Hartford Corporation. Multilayer absorbent structure. 4,360,015, Cl. 128-156.000.
McAndrew, Miles J., to General Electric Co. Poppet valve for baghouse outlet plenum. 4,360,370, Cl. 55-302.000.
McArthur, Mary J.; Marantz, Laurence B.; and Scarbrough, Abb L., to Organon Teknika Corporation. Sodium zirconium carbonate compound and the method of its preparation. 4,360,507, Cl. 423-419.00P.
McCarty, William J., to General Electric Company. Refrigeration system modulating means. 4,359,874, Cl. 62-117.000.
McCarty, William J., to General Electric Company. Room air conditioner sensor application. 4,359,876, Cl. 62-180.000.
McClintic, Robert P.: *See*—
MacInnis, Martin B.; McClintic, Robert P.; and Kim, Tai K., 4,360,502, Cl. 423-54.000.
McCoy, Lowell R., to United States of America, Energy. Method of enhancing the wettability of boron nitride for use as an electrochemical cell separator. 4,360,578, Cl. 429-247.000.
McDonnell Douglas Corporation: *See*—
Boehringer, Wilfred E., 4,360,239, Cl. 303-117.000.
McFarlane, Richard H. Device for molding flash caps for catheters. 4,360,330, Cl. 425-122.000.
McGill, Robert W.; and Winiasz, Michael E., to A-T-O Inc. Case feed control for article handling apparatus. 4,360,101, Cl. 198-461.000.
McGinn, Michael: *See*—
Main, William E.; and McGinn, Michael, 4,360,866, Cl. 363-127.000.
McHarrie, John C.; and Hopcroft, Peter W., to National Research Development Corporation. External fixation devices for orthopaedic fractures. 4,360,012, Cl. 128-92.0EB.
McIntosh, Alan R.: *See*—
Bolton, James R.; Ho, Te-Fu; and McIntosh, Alan R., 4,360,703, Cl. 136-263.000.
McKaveney, James P.; and Simpson, Vernon P., to Occidental Chemical Corporation. Composition for corrosion protection using metal silicides or alloys of silicon and metals. 4,360,384, Cl. 106-1.120.
McMillan, Moses W.; and Szmuszkovicz, Jacob, to Upjohn Company, The. Substituted cycloalkanes. 4,360,531, Cl. 424-274.000.
McNinch, Delmar, to Lawrence Brothers, Inc. Load supporting hinge structure with concealed angular bearing. 4,359,804, Cl. 16-276.000.
McVey, James M., to International Business Machines Corporation. Programmable I/O device identification. 4,360,870, Cl. 364-200.000.
Mead Corporation, The: *See*—
Rounsley, Robert R., 4,359,826, Cl. 34-1.000.
Measurex Corporation: *See*—
Leffler, Nils; and Kaski, Kalevi, 4,359,950, Cl. 110-188.000.
Mechanical Technology Incorporated: *See*—
Curwen, Peter, 4,360,087, Cl. 188-379.000.
Medi-Physics, Inc.: *See*—
Baldwin, Ronald M.; Lin, Tz-Hong; and Winchell, Harry S., 4,360,511, Cl. 424-1.500.
Medical Engineering Corporation: *See*—
Finney, Roy P., 4,360,010, Cl. 128-79.000.
Medtronic, Inc.: *See*—
Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas L., 4,360,030, Cl. 128-702.000.
Martindale, Diane S.; and Hepp, Dennis G., 4,360,125, Cl. 221-2.000.
Rao, T. V.; and Nutzman, Thomas M., 4,360,573, Cl. 429-72.000.
White, David L., 4,360,031, Cl. 128-786.000.
Mehl, Wolfgang, to Ciba-Geigy AG. Transfer-printing carriers: red component dye mixture for polyacrylonitrile. 4,360,357, Cl. 8-471.000.
Meier, Richard H.: *See*—
Fletcher, Ivan M.; and Meier, Richard H., 4,360,410, Cl. 204-23.000.
Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Arrangement for a planetary drive assembly. 4,359,914, Cl. 74-788.000.
Melillo, David G.: *See*—
Cvetovich, Raymond J.; Melillo, David G.; Ryan, Kenneth M.; and Sletzinger, Meyer, 4,360,684, Cl. 549-291.000.
Mellblom, Howard M.; and Maxwell, John M. Aircraft weather vane mooring device. 4,360,175, Cl. 244-115.000.

Mellovist, Allan; and Anderberg, Thorild N. K. E. Method of improving the combustion of fuel containing hydrocarbon compounds in the combustion chamber or chambers of internal combustion engines, and a liquid composition for carrying the method into effect. 4,359,969, Cl. 123-1.00A.

Melvin, Lawrence S., Jr, to Pfizer Inc. Intermediates for making 1-(3-benzyloxyphenyl)-1,1-dimethylheptane. 4,360,700, Cl. 568-644.000.

Mendelsohn, Marshall H.; and Gruen, Dieter M., to United States of America, Energy. Oxygen stabilized zirconium-vanadium-iron alloy. 4,360,445, Cl. 252-181.600.

Mendola, Charles F., to Simala, John J., a part interest. Cutting and chiseling assembly for mining machine and method performed thereby. 4,360,235, Cl. 299-18.000.

Menezes, William A.; Kuper, Douglas D.; and Wheeler, David, to Sony Corporation. Apparatus and method for determining time code addresses at low tape speed. 4,360,843, Cl. 360-72.200.

Menjo, Yoshihiro: *See*—
Ozawa, Isao; Nagai, Yutaka; and Menjo, Yoshihiro, 4,360,549, Cl. 428-31.000.

Merck & Co., Inc.: *See*—
Cvetovich, Raymond J.; Melillo, David G.; Ryan, Kenneth M.; and Sletzinger, Meyer, 4,360,684, Cl. 549-291.000.
Freidinger, Roger M.; and Veber, Daniel F., 4,360,516, Cl. 424-177.000.
Patchett, Arthur A., 4,360,533, Cl. 424-309.000.

Merli, Giovanni: *See*—
Beccalori, Ferruccio; Corvi, Gianguido; Merli, Giovanni; Tamburoni, Giancarlo; and Tamburoni, Lorenzo, 4,360,167, Cl. 241-101.00A.

Merrie, Kenneth: *See*—
Walker, Brian; and Merrie, Kenneth, 4,360,433, Cl. 210-484.000.

Mesch, Keith A.: *See*—
Kugele, Thomas G.; Mesch, Keith A.; and Wursthorn, Karl R., 4,360,619, Cl. 524-181.000.

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Frommlet, Hubert; and Stangl, Ludwig, 4,360,337, Cl. 416-141.000.

Metz, Louis C.; and Prohofsky, Leroy A., to Sperry Corporation. Distributed status reporting system. 4,360,912, Cl. 370-96.000.

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Brokaw, Paul E.; Adeboi, Frans L.; Feimer, Bryan A.; Freeman, James G.; Kawolics, Raymond P.; and Stanbrook, Frank C., 4,360,129, Cl. 222-146.00H.

Meyer, Hans R.; and Weber, Kurt, to Ciba-Geigy Corporation. Benzofuranyl-benzimidazoles. 4,360,679, Cl. 548-327.000.

Meyer, Horst; Franckowiak, Gerhard; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, to Bayer Aktiengesellschaft. 1,4-Dihydropyridazine compounds, and their medicinal use. 4,360,520, Cl. 424-250.000.

Meyer, Walter E.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., to American Cyanamid Company. N'-[2,6-Dichloro-4-(substituted-benzylideneamino)phenyl]-N,N-dimethylformamidines. 4,360,466, Cl. 549-442.000.

Mezick, James A.: *See*—
Rovee, David T.; Marvel, John R.; and Mezick, James A., 4,360,518, Cl. 424-240.000.

Microdynamics, Inc.: *See*—
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,359,953, Cl. 112-121.110.

Microwriter Limited: *See*—
Endfield, Cyril, 4,360,892, Cl. 364-900.000.

MIGUA-Hammerschmidt GmbH & Co.: *See*—
Schukolinski, Manfred, 4,359,847, Cl. 52-396.000.

Milberger, Ernest C.: *See*—
Lemanski, Michael F.; Spitnale, Gregory G.; and Milberger, Ernest C., 4,360,453, Cl. 252-435.000.

Miles, James M. Dual key locks having improved precision and versatility. 4,359,884, Cl. 70-339.000.

Miller, Donald R., to Owens-Corning Fiberglas Corporation. Cooling asphaltic strip material. 4,359,873, Cl. 62-63.000.

Miller, James A., to Morgan Adhesives Company. Phosphorescent abrasive coated product for safety tread. 4,360,557, Cl. 428-142.000.

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Miller, John A.: *See*—
Claxton, William B.; Casey, Gary L.; Blatter, Albert; and Miller, John A., 4,360,161, Cl. 239-463.000.

Miller, Stephen J., to Chevron Research Company. Catalytic dewaxing. 4,360,419, Cl. 208-111.000.

Miller, Steven J.: *See*—
Schlatter, Lester E.; and Miller, Steven J., 4,360,152, Cl. 237-13.000.

Mimura, Akio; Takahashi, Yasuyuki; Yuasa, Katsumi; and Shibukawa, Mitsuru, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing L-tryptophan or derivatives thereof using microorganisms. 4,360,594, Cl. 435-108.000.

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Asakura, Hiroshi; Chimura, Ippei; Taguchi, Teruaki; and Minagawa, Renzo, 4,360,550, Cl. 428-35.000.

Minasov, Alexandr N.: *See*—
Silka, Adolf N.; Minasov, Alexandr N.; Kulakov, Nikolai K.; Likhogub, Evgeny P.; Dorfman, Gersh A.; Azimov, Alexandr A.; Davydenko, Vladimir M.; Marapulets, Gennady N.; Shestakov, Valentin A.; and Gromov, Nikolai F., 4,360,403, Cl. 202-263.000.

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Kawaguchi, Takeyuki; Minematsu, Hiroyoshi; Hayashi, Yuzuru; Hara, Shigeyoshi; and Ueda, Fumio, 4,360,434, Cl. 210-500.200.

Minnesota Mining and Manufacturing Company: *See*—
Barrows, Thomas H., 4,360,013, Cl. 128-130.000.

Mita Industrial Company Limited: *See*—
Miyoshi, Yoshitake; Fujii, Jiro; Nakanishi, Tsugio; Takahashi, Ichiro; Tsudaka, Hideaki; and Kai, Masami, 4,360,263, Cl. 355-29.000.

Mita, Michio, to Sony Corporation. Data correction circuit. 4,360,841, Cl. 360-13.000.

Mita, Yoichi: *See*—
Tajima, Osamu; Yamamura, Takashi; Mochizuki, Masafumi; and Mita, Yoichi, 4,360,845, Cl. 360-133.000.

Mitchell, Winalee G. Cover for stirrup of physician's examination table. 4,360,193, Cl. 269-328.000.

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Yamamoto, Seiichiro; Adachi, Hiromi; and Iwaya, Shoichi, 4,360,762, Cl. 315-101.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Hijikata, Kenji; and Sakaguchi, Kouichi, 4,360,608, Cl. 523-450.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Ikeda, Minoru; Okada, Kazuya; Matsumura, Hiroshi; and Tachihata, Takeichi, 4,360,406, Cl. 203-32.000.

Mitsuhashi, Masakazu: *See*—
Maruyama, Eisuke; Kobayashi, Hiromitsu; Mitsuhashi, Masakazu; Takeuchi, Hiromichi; Futamura, Yoshiki; and Suzuki, Naohito, 4,360,127, Cl. 222-14.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Morinaka, Ryoichi; Tukahara, Ryoichi; Nishizawa, Tsutomu; and Hidaka, Tuneo, 4,360,447, Cl. 252-299.100.

Miura, Nobuo; and Akiba, Yuichi, to Lonseal Corporation. Open cell foam resin sheet having a relief pattern thereon. 4,360,558, Cl. 428-159.000.

Miyahara, Sadayasu: *See*—
Wakimoto, Saburo; Miyahara, Sadayasu; and Hyosu, Yoshihiko, 4,360,611, Cl. 523-216.000.

Miyaki, Takeo: *See*—
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Miyazaki, Kenichi; Miyoshi, Tadayoshi; Takanashi, Itsuo; Nakagaki, Shintaro; Motoyama, Koichiro; Yokokawa, Sumio; and Ichimura, Hiroshi. Image pickup device. 4,360,826, Cl. 358-44.000.

Miyoshi, Tadayoshi: *See*—
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Mizuguchi, Yoshihiko; and Akagawa, Masataka, to Kokusai Denshin Denwa Kabushiki Kaisha. Bifocal reflector antenna and its configuration process. 4,360,815, Cl. 343-781.00P.

Mizuho Ika Kogyo Kabushiki Kaisha: *See*—
Sugita, Keiichiro; and Nemoto, Gunji, 4,360,023, Cl. 128-325.000.

Mobil Oil Corporation: *See*—
DiBiasi, Daniel J.; and Krutchen, Charles M., 4,360,486, Cl. 264-37.000.
Guarino, John P.; and Schwab, Frederick C., 4,360,551, Cl. 428-35.000.
Holden, Morell J., Jr., 4,360,491, Cl. 264-294.000.
Kuklies, Milton C.; and Reimann, George J., 4,360,170, Cl. 242-56.00R.
Tobias, Michael A., 4,360,640, Cl. 525-301.000.
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Tajima, Osamu; Yamamura, Takashi; Mochizuki, Masafumi; and Mita, Yoichi, 4,360,845, Cl. 360-133.000.

Modine Manufacturing Company: *See*—
Frost, Donald J., 4,360,055, Cl. 165-38.000.

Molins Machine Company, Inc.: *See*—
Craemer, Robert H.; and Scardapane, Anthony N., 4,360,538, Cl. 427-8.000.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,360,399, Cl. 156-277.000.

Monogram Industries, Inc.: *See*—
Roberts, George C., 4,359,789, Cl. 4-300.000.

Monroe, Paul S., to Halcon SD Group, Inc., The. Method of coating or lining metals. 4,359,811, Cl. 29-421.00R.

Monsanto Company: *See*—
Griffith, Edward J., 4,360,625, Cl. 524-414.000.
Howe, Robert K.; and Lee, Len F., 4,360,678, Cl. 548-236.000.
Trementozzi, Quirino A., 4,360,618, Cl. 524-141.000.

Montedison S.p.A.: *See*—
Calmanti, Giulio; Gafa, Salvatore; Dadea, Giovanni M.; Gatti, Alfonso; and Burzio, Fulvio, 4,360,439, Cl. 252-61.000.

Mookherjee, Braja D.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,360,032, Cl. 131-276.000.

Moore, Charles W.: *See*—
Langston, Earl M.; Moore, Charles W.; Malecki, Richard L.; and Bruot, Roger C., 4,360,877, Cl. 364-465.000.

Moore, Jerry P.: *See*—
Ahlstrom, Ross C., Jr.; Johnson, Mark S.; Moore, Jerry P.; and Schoppe, Ivo R., Jr., 4,359,891, Cl. 73-23.100.
Moore, Richard F., to Combustion Engineering, Inc. Structural water seal trough. 4,359,949, Cl. 110-171.000.
Moran, Christopher J.: *See*—
Barbier, Jean Y.; and Moran, Christopher J., 4,360,028, Cl. 128-659.000.
Moraw, Roland; and Schadlich, Renate, to Hoechst Aktiengesellschaft. Information carriers, method of forming and copying said carriers. 4,360,408, Cl. 204-4.000.
Morgan Actuators, Inc.: *See*—
Morgan, William L., 4,360,752, Cl. 310-82.000.
Morgan Adhesives Company: *See*—
Miller, James A., 4,360,557, Cl. 428-142.000.
Morgan, William L., to Morgan Actuators, Inc. Nutating motor gate valve operator and rotor assembly. 4,360,752, Cl. 310-82.000.
Mori, Leo: *See*—
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Mori, Seiji: *See*—
Yamamura, Takamasa; Mori, Seiji; Asada, Koichi; Shinoda, Kenichi; and Higo, Yuichi, 4,360,391, Cl. 148-12.00E.
Morigaki, Masakazu: *See*—
Kojima, Tetsuro; Morigaki, Masakazu; Hamaoka, Tsutomu; and Sawada, Satoru, 4,360,589, Cl. 430-551.000.
Moriguchi, Haruhiko; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Heat-sensitive recording head with minimum number of switching diodes. 4,360,818, Cl. 346-76.0PH.
Morin, William J., III; and Woodford, Thomas E. Process monitoring apparatus and method. 4,359,907, Cl. 73-863.210.
Morinaka, Ryoichi; Tukahara, Ryoichi; Nishizawa, Tsutomu; and Hidaka, Tuneo, to Mitsui Toatsu Chemicals, Inc. Composition for liquid crystal color display elements. 4,360,447, Cl. 252-299.100.
Morishita, Teru: *See*—
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,360,165, Cl. 239-703.000.
Moroishi, Taishi: *See*—
Tarutani, Yoshio; Moroishi, Taishi; and Koike, Masao, 4,360,381, Cl. 75-126.00F.
Morris, David E., to Morris Industries Ltd. Apparatus for recovering fluids floating on water. 4,360,429, Cl. 210-242.300.
Morris Industries Ltd.: *See*—
Morris, David E., 4,360,429, Cl. 210-242.300.
Morris, Jesse L., to General Electric Company. Feeder assembly for strip material. 4,360,140, Cl. 226-162.000.
Morse, David L.: *See*—
Borrelli, Nicholas F.; Morse, David L.; and Schreurs, Jan W. H., 4,360,441, Cl. 252-62.590.
Mosberger, Clemens, to Bernal AG. Expansion plug for securing fastening elements. 4,360,301, Cl. 411-57.000.
Moskin, Jeffrey M.: *See*—
Smith, Jay, III; and Moskin, Jeffrey M., 4,360,808, Cl. 340-825.690.
Mostek Corporation: *See*—
Plachno, Robert S.; and Jiang, Ching-Lin, 4,360,903, Cl. 365-222.000.
Proebsting, Robert J., 4,360,901, Cl. 365-189.000.
Proebsting, Robert J., 4,360,902, Cl. 365-189.000.
Motorola, Inc.: *See*—
Main, William E.; and McGinn, Michael, 4,360,866, Cl. 363-127.000.
Motosugi, Katsuhiko: *See*—
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Motoyama, Koichiro: *See*—
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Mowbray, Dorian F., to Lucas Industries Limited. Fuel injection pumping apparatus. 4,359,995, Cl. 123-502.000.
Muchow, John D.: *See*—
Cove, Harry R.; and Muchow, John D., 4,360,040, Cl. 137-625.300.
Muellejans, Herbert, to Sueddeutsche Kuehlerfabrik julius fr. behr GmbH & Co. KG. Process for the preparation of a surface of a metal wall for the transfer of heat. 4,360,058, Cl. 165-104.210.
Mueller, Otto. Governor weight retainer assembly for fuel pump. 4,359,985, Cl. 123-373.000.
Muller, Alfred; and Sauer, Joseph, to Robert Bosch GmbH. Gearshift method and apparatus. 4,360,092, Cl. 192-12.00C.
Muller, Helmut; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Stabilizer systems of triarylphosphites and phenols. 4,360,617, Cl. 524-101.000.
Muller, Jean-Claude: *See*—
Hengartner, Urs; Muller, Jean-Claude; and Ramuz, Henri, 4,360,521, Cl. 424-251.000.
Muller, Klaus: *See*—
Marker, Wolfgang; Muller, Klaus; and Roller, Wilhelm, 4,360,496, Cl. 376-298.000.
Muller, Werner, to Sandoz Ltd. Dibenzazepine derivatives, pharmaceutical compositions containing them, and methods of use. 4,360,525, Cl. 424-267.000.
Murata Manufacturing Co., Ltd.: *See*—
Toyoshima, Isao; and Ohtsuka, Eizo, 4,360,754, Cl. 310-366.000.
Murata, Wataru: *See*—
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Murphree, Gary R.: *See*—
Evans, Walter R.; Murphree, Gary R.; and Osborne, Shelly M., 4,359,886, Cl. 70-366.000.
Murray, Milton C.; and Donatelli, Joan M., to Dow Corning Corporation. Method of improving silicone rubber composition. 4,360,610, Cl. 523-212.000.
Murray, Sidney J., to Ramatian Pty. Ltd. Apparatus for cooking and dispensing food. 4,359,935, Cl. 99-331.000.
Musacchia, John. Emergency air vent. 4,359,934, Cl. 98-118.000.
Musacchia, John: *See*—
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Mustroph, Heinz: *See*—
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Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; and Schlag, Johannes, to BASF Aktiengesellschaft. Preparation of electrically conductive polyaromatics. 4,360,644, Cl. 525-390.000.
Naarmann, Herbert: *See*—
Lindenschmidt, Gerhard; Schulte, Wolfgang; Brandstetter, Franz; Naarmann, Herbert; and Penzien, Klaus, 4,360,455, Cl. 252-609.000.
Nadherny, Rudolph E.; and Sweger, Theodore J., to Illinois Railway Equipment Company. Self-resetting snubbing and anchoring device. 4,360,299, Cl. 410-34.000.
Nadherny, Rudolph E.; and Sweger, Theodore J., to Illinois Railway Equipment Company. Self-resetting snubbing anchoring and releasing lading strapping on railway freight cars. 4,360,300, Cl. 410-34.000.
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Naarmann, Herbert; Naegele, Dieter; Penzien, Klaus; and Schlag, Johannes, 4,360,644, Cl. 525-390.000.
Naffziger, Dewein H. Process for the removal of rust from cast iron borings and the like in preparation for melting. 4,360,379, Cl. 75-43.000.
Nagahara, Shusaku: *See*—
Tsukada, Toshihisa; Maruyama, Eiichi; Baji, Toru; Ataka, Saburo; Imamura, Yoshinori; Sasano, Akira; Kubo, Masaharu; Koike, Norio; and Nagahara, Shusaku, 4,360,821, Cl. 357-31.000.
Nagai, Yutaka: *See*—
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Naganawa, Hiroshi: *See*—
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Nagasaki, Hideo: *See*—
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Nagasawa, Kiyoto; and Narumi, Yuzi, to Ricoh Company, Ltd. Lamp power regulator. 4,360,783, Cl. 328-144.000.
Nagy, Charles K., to United States of America, Energy. Coal gasification apparatus. 4,360,361, Cl. 48-77.000.
Naimer, Hubert Laurenz: *See*—
Alsch, Gottfried, 4,360,719, Cl. 200-65.000.
Alsch, Gottfried, 4,360,720, Cl. 200-65.000.
Nakagaki, Shintaro: *See*—
Miyazaki, Kenichi; Miyoshi, Tadayoshi; Takanashi, Itsuo; Nakagaki, Shintaro; Motoyama, Koichiro; Yokokawa, Sumio; and Ichimura, Hiroshi, 4,360,826, Cl. 358-44.000.
Nakahira, Tomotake: *See*—
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Nakamura, Yoshikatsu: *See*—
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,360,383, Cl. 75-236.000.
Nakanishi, Kiyoshi: *See*—
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Nakanishi, Tsugio: *See*—
Miyoshi, Yoshitake; Fujii, Jiro; Nakanishi, Tsugio; Takahashi, Ichiro; Tsudaka, Hideaki; and Kai, Masami, 4,360,263, Cl. 355-29.000.
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Nakao, Kiyoharu. Fuel control device for diesel engine. 4,359,984, Cl. 123-357.000.
Nakao, Yasuo; and Norimatsu, Nobuo, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust system for multicylinder motorbike engine. 4,359,865, Cl. 60-313.000.
Nakasaki, Eiji, to Sumitomo Rubber Industries, Ltd. Low pressure low speed tire. 4,360,050, Cl. 152-354.00R.
Nakaya, Masaaki: *See*—
Nishimura, Haruo; Nakaya, Masaaki; Nakano, Katsuji; Matsuda, Noboru; and Matsumoto, Noriyuki, 4,360,130, Cl. 222-153.000.
Nakazawa, Tetsuji: *See*—
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Nalos, Ervin J.: *See*—
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Namsick, Raymond J.: *See*—
Knaus, Ernest; Namsick, Raymond J.; and Smith, Herbert D., 4,360,124, Cl. 220-452.000.

Naphtachimie Societe Anonyme: *See—*
Desvignes, Bernard; Bailly, Jean C.; and Mangin, Pierre, 4,360,650, Cl. 526-60.000.
Narikiyo, Kazuhiko: *See—*
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Narita, Kinzo: *See—*
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Narumi, Yuzi: *See—*
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Nascimento, Agostinho U. Method of making a precision die set. 4,359,915, Cl. 76-107.00R.
Nash, Richard C.: *See—*
Fox, Lonnie G.; Hanson, David W.; and Nash, Richard C., 4,360,333, Cl. 425-299.000.
National Research Council of Canada: *See—*
Bolton, James R.; Ho, Te-Fu; and McIntosh, Alan R., 4,360,703, Cl. 136-263.000.
National Research Development Corporation: *See—*
Bibb, Mervyn J.; and Hopwood, David A., 4,360,597, Cl. 435-253.000.
Downs, Michael J.; and Raine, Kenneth W., 4,360,271, Cl. 356-351.000.
McHarrie, John C.; and Hopcroft, Peter W., 4,360,012, Cl. 128-92.0EB.
Payne, David N.; and Gambling, William A., 4,360,250, Cl. 350-96.300.
National Starch and Chemical Corporation: *See—*
Runavot, Yves; Billault, Georges; and Salvetat, Jacques, 4,360,628, Cl. 524-508.000.
Naumann, Klaus: *See—*
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,360,690, Cl. 560-57.000.
Nauroth, Peter; Kuhlmann, Robert; Turk, Gunther; Bode, Rudolf; and Reisert, Arthur, to Degussa Aktiengesellschaft. Cerium containing precipitated silica, process for its production. 4,360,388, Cl. 106-288.00B.
Naylor, Floyd E., to Phillips Petroleum Company. Method of preparing lactone block copolymers. 4,360,643, Cl. 525-386.000.
NCR Canada Ltd.-NCR Canada Ltee.: *See—*
Kustedjo, Simon; and Mak, Kuen H., 4,360,916, Cl. 371-37.000.
Nedschroef Octrooi Maatschappij N.V.: *See—*
Bouwman, Johannes E., 4,359,794, Cl. 10-85.000.
Nehmey, Samuel D.; and Summers, James W., to B. F. Goodrich Company, The. Foamed chlorinated polyvinyl chloride and compositions for making same. 4,360,602, Cl. 521-95.000.
Nelboeck, Michael: *See—*
Beaucamp, Klaus; Nelboeck, Michael; Gauhl, Helmgard; Seidel, Hans; Gruber, Wolfgang; and Brunner, Herwig, 4,360,596, Cl. 435-197.000.
Nelson, Donald L., to Dow Chemical Company, The. Polyester resins containing diene oligomers. 4,360,634, Cl. 525-36.000.
Nemas, Mara: *See—*
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,360,480, Cl. 260-944.000.
Nemoto, Gunji: *See—*
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Nettesheim, Daniel R.; and Guyer, Robert R., to Schwaab, Inc. Method and apparatus for producing printing patterns. 4,360,267, Cl. 355-132.000.
Nettleton, Donald E., Jr.: *See—*
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Neuber, Ralph E.: *See—*
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Neubert, Werner: *See—*
Schadlich, Fritz; Armbruster, Gerhard; Neubert, Werner; and Stierle, Peter, 4,360,048, Cl. 145-4.000.
Neumann, Charles G., to Reynolds Products Inc. Beverage dispenser having timed operating period responsive to reservoir quantity. 4,360,128, Cl. 222-26.000.
Neumann, Karl-Heinz; Hagenlocher, Walter; Kleebaur, Karl; and Christ, Klaus H., to Robert Bosch GmbH. Automotive alternator construction. 4,360,749, Cl. 310-42.000.
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Newman, Walter: *See—*
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NGK Insulators, Ltd.: *See—*
Otagiri, Tadashi; Watanabe, Tetsuo; and Mase, Syunzo, 4,360,598, Cl. 501-103.000.
Niederer, Kurt W., to Terrell Machine Company, The. Apparatus for filtering particulates from a fluid. 4,360,369, Cl. 55-283.000.
Niederer, Lee H.; and Niederer, Thomas O., to Otto Niederer Sons, Inc. Egg transfer apparatus. 4,360,099, Cl. 198-424.000.
Niederer, Peter G., to Gebruder Sulzer, Aktiengesellschaft Protek A.G. Hip joint prosthesis. 4,359,785, Cl. 3-1.913.
Niederer, Thomas O.: *See—*
Niederer, Lee H.; and Niederer, Thomas O., 4,360,099, Cl. 198-424.000.
Nielsen, Steven T.: *See—*
Ishimaru, Kenzo; and Nielsen, Steven T., 4,360,150, Cl. 233-26.000.
Nihon Rajieeta Kabushiki Kaisha (Nihon Radiator Co., Ltd.): *See—*
Suyama, Eizo, 4,360,076, Cl. 181-265.000.
Niinuma, Akira, to Alps Electric Co., Ltd. Push button switch with alternate action mechanism. 4,360,721, Cl. 200-153.00J.
Nikitas, Nick C., to Delta Electronics Mfg. Corp. Coaxial connector. 4,360,245, Cl. 339-218.00R.
Nikkiso, Co. Ltd.: *See—*
Ohara, Shozo; and Ichinose, Toshio, 4,360,324, Cl. 417-388.000.
Nikles, Erwin, to Ciba-Geigy Corporation. Homopolymers and copolymers of vinyl ethers of polyalkylpiperidinols and their use as stabilizers for plastics. 4,360,675, Cl. 546-216.000.
Nimry, Tayseer S.; and Fields, Ellis K., to Standard Oil Company (Indiana). Tricyclo[6.4.0.0^{2,7}]-dodecane-1,8,2,7-tetracarboxylic acid dianhydride and polyimides therefrom. 4,360,657, Cl. 528-188.000.
Nippon Electric Co., Ltd.: *See—*
Ohura, Toshio, 4,360,804, Cl. 340-703.000.
Taguchi, Tetsu; and Ochiai, Kazuo, 4,360,708, Cl. 179-15.55R.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Iijima, Kenzaburo; Kurahashi, Kazuo; and Hoshi, Toshiharu, 4,360,382, Cl. 75-200.000.
Nippon Oil Co., Ltd.: *See—*
Tsuchiya, Shozo; Oshima, Akio; and Hayshi, Hideo, 4,360,622, Cl. 524-275.000.
Nippon Piston Ring Co., Ltd.: *See—*
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,360,383, Cl. 75-236.000.
Nippon Soken, Inc.: *See—*
Igashira, Toshihiko; Yoshida, Hitoshi; Nomura, Ken; and Abe, Seiko, 4,359,974, Cl. 123-52.00M.
Matsui, Takeshi; and Idogaki, Takaharu, 4,360,089, Cl. 192-2.000.
Nippon Stainless Steel Co., Ltd.: *See—*
Tarutani, Yoshio; Moroishi, Taishi; and Koike, Masao, 4,360,381, Cl. 75-126.00F.
Nippon Steel Corporation: *See—*
Tominaga, Jiro; Shinada, Wataru; Murata, Wataru; and Ito, Masahiro, 4,360,390, Cl. 148-12.00B.
Nippon Telegraph & Telephone Public Corporation: *See—*
Hamazato, Kazuo; Kitano, Junjiro; and Takeshita, Tetsuo, 4,360,709, Cl. 179-18.0FA.
Nippondenso Co., Ltd.: *See—*
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,360,353, Cl. 474-12.000.
Ohba, Masahiro, 4,360,855, Cl. 361-154.000.
Ohba, Masahiro; Ito, Kenzo; Akiyama, Susumu; Hirabayashi, Yuuji; Hirano, Satoshi; and Ooka, Naoto, 4,360,874, Cl. 364-431.040.
Nishikawa, Kazunori: *See—*
Takahashi, Nobuaki; Nishikawa, Kazunori; Masuda, Isao; and Sato, Hideo, 4,360,824, Cl. 358-323.000.
Nishimura, Haruo; Nakaya, Masaaki; Nakano, Katsuji; Matsuda, Noboru; and Matsumoto, Noriyuki, to Duskin Franchise Kabushiki Kaisha; and Kabushiki Kaisha Sunpak. Dispenser, particularly for liquid soap. 4,360,130, Cl. 222-153.000.
Nishizawa, Tsutomu: *See—*
Morinaka, Ryoichi; Tukahara, Ryoichi; Nishizawa, Tsutomu; and Hidaka, Tuneo, 4,360,447, Cl. 252-299.100.
Nissan Motor Company, Limited: *See—*
Asano, Masaharu; Tamura, Hideyuki; and Furuhashi, Shoji, 4,359,992, Cl. 123-480.000.
Fukunaga, Yukio, 4,360,241, Cl. 339-10.000.
Ideta, Yasufumi, 4,359,869, Cl. 60-547.00B.
Ikeura, Kenji; and Sawamoto, Kunifumi, 4,359,894, Cl. 73-118.000.
Masaki, Kenji; Sone, Kohki; and Takase, Sadao, 4,359,989, Cl. 123-438.000.
Matsubara, Yuji, 4,359,988, Cl. 123-424.000.
Nisshin Steel Co., Ltd.: *See—*
Yamamura, Takamasa; Mori, Seiji; Asada, Koichi; Shinoda, Kenichi; and Higo, Yuichi, 4,360,391, Cl. 148-12.00E.
Nitschke, John S. Roll operator for glass sheet conveyor of bending system. 4,360,374, Cl. 65-273.000.
Noe, Andreas: *See—*
Noe, Oskar; Noe, Rolf; and Noe, Andreas, 4,360,137, Cl. 226-24.000.
Noe, Oskar; Noe, Rolf; and Noe, Andreas, to BWG Bergwerk - und Walzwerk-Maschinenbau GmbH. Planetary-gear drive for looper. 4,360,137, Cl. 226-24.000.
Noe, Rolf: *See—*
Noe, Oskar; Noe, Rolf; and Noe, Andreas, 4,360,137, Cl. 226-24.000.
Nohl, Alvin L., Jr.: *See—*
Nohl, Arthur H.; Nohl, DeWayne A.; and Nohl, Alvin L., Jr., 4,360,215, Cl. 280-413.000.
Nohl, Arthur H.; Nohl, DeWayne A.; and Nohl, Alvin L., Jr. Drill hitch transport. 4,360,215, Cl. 280-413.000.
Nohl, DeWayne A.: *See—*
Nohl, Arthur H.; Nohl, DeWayne A.; and Nohl, Alvin L., Jr., 4,360,215, Cl. 280-413.000.
Nomura, Ken: *See—*
Igashira, Toshihiko; Yoshida, Hitoshi; Nomura, Ken; and Abe, Seiko, 4,359,974, Cl. 123-52.00M.
Norbedo, Robert A.: *See—*
Fahey, Robert J.; and Norbedo, Robert A., 4,360,890, Cl. 364-900.000.
Nordson Corporation: *See—*
Kostas, Evans; Crum, Gerald W.; and Walker, Jerome F., 4,360,886, Cl. 364-551.000.

Vilagi, Burton J.; Scharf, Donald R.; and Macartney, Lawrence J., 4,360,132, Cl. 222-504.000.
Nordstrom, Barbara Ann: *See*—
Nordstrom, John E., 4,360,098, Cl. 198-419.000.
Nordstrom, John E., to Nordstrom, Barbara Ann, a part interest. Infeed conveyor. 4,360,098, Cl. 198-419.000.
Norimatsu, Nobuo: *See*—
Nakao, Yasuo; and Norimatsu, Nobuo, 4,359,865, Cl. 60-313.000.
Normandeau, Jean-Paul: *See*—
Mantion, Richard; and Normandeau, Jean-Paul, 4,360,153, Cl. 238-14.000.
Normann, Richard W.; and Fairbairn, Leroy W., to Bendix Corporation, The. Mold core for electrical connector assembly. 4,360,185, Cl. 249-175.000.
Norris, Jerry L.; and Hartman, Clinton S., to Texas Instruments Incorporated. Frequency converting filter. 4,360,791, Cl. 333-165.000.
Norris, Peter J. Portable tire tool. 4,360,052, Cl. 157-1.300.
North American Car Corporation: *See*—
Anderson, Arthur I., 4,360,295, Cl. 406-75.000.
North American Philips Consumer Electronics Corp.: *See*—
Kreidler, James F.; Neuber, Ralph E.; and Swank, Harry R., 4,360,837, Cl. 358-246.000.
North American Philips Corporation: *See*—
Goldowsky, Michael P., 4,359,872, Cl. 62-6.000.
North, James C.: *See*—
Bobeck, Andrew H.; and North, James C., 4,360,893, Cl. 365-36.000.
Northern Telecom Limited: *See*—
Chaput, Guy J.; and Sich, Edward M., 4,360,710, Cl. 179-81.00R.
Maciejko, Roman, 4,360,372, Cl. 65-4.210.
Northern Vibrator Manufacturing Ltd.: *See*—
Jack, James M., 4,360,276, Cl. 366-101.000.
Norton-Wayne, Leonard, to USM Corporation. Workpiece identification apparatus. 4,360,274, Cl. 356-394.000.
Noutko, Theodore E.; Toms, Steve D.; and Light, David P. Capacitor protective device. 4,360,848, Cl. 361-15.000.
Novak, William P.; Toepke, Ival; and White, John, to Bicron Corporation. Window assembly for a deep well scintillation detector. 4,360,733, Cl. 250-361.00R.
Nowell, John R., to Honeywell Information Systems Inc. Maximum frequency detector. 4,360,782, Cl. 328-140.000.
Numazawa, Akio; Koga, Hideaki; and Suzuki, Satomi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Shift mechanism for power transmissions. 4,359,910, Cl. 74-476.000.
Nurrenbach, Axel: *See*—
Schmidt, Wolfram; Paust, Joachim; and Nurrenbach, Axel, 4,360,669, Cl. 260-207.500.
Nutzman, Thomas M.: *See*—
Rao, T. V.; and Nutzman, Thomas M., 4,360,573, Cl. 429-72.000.
NWM de Kruithoorn B.V.: *See*—
Abet, Hans-Guenter; and Maas, Adrianus T., 4,359,925, Cl. 86-43.000.
Nygren, Robert: *See*—
Kleemann, Axel; Nygren, Robert; and Wagner, Rudolf, 4,360,697, Cl. 564-475.000.
Nyman, Bengt E.; and Lehmann, Jerry H., to Mangum-Sickles Industries, Inc. Camera having stepper motor driven film transport/registration sprocket. 4,360,254, Cl. 352-166.000.
O&K Orenstein & Koppel Aktiengesellschaft: *See*—
Schoneweiss, Klaus, 4,360,078, Cl. 187-12.000.
Ober, Lawrence R.: *See*—
Sindelar, Emmett F.; and Ober, Lawrence R., 4,360,917, Cl. 371-49.000.
Oberlander, Richard K.; and Decker, Lewis B., Jr., to Conoco Inc. Alumina dispersion behavior. 4,360,449, Cl. 252-313.00R.
O'Blasny, Richard: *See*—
Fletcher, Laird C.; Beard, Harold J.; and O'Blasny, Richard, 4,360,420, Cl. 208-184.000.
Occidental Chemical Corporation: *See*—
McKaveney, James P.; and Simpson, Vernon P., 4,360,384, Cl. 106-1.120.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E., 4,360,233, Cl. 299-2.000.
Ochiai, Kazuo: *See*—
Taguchi, Tetsu; and Ochiai, Kazuo, 4,360,708, Cl. 179-15.55R.
Ockers, Muriel M.: *See*—
Forster, Alette J.; and Ockers, Muriel M., 4,360,820, Cl. 346-135.100.
O'Connell, Thomas F., to Spencertown Geo-Solar Associates. Geokinetic energy conversion. 4,360,056, Cl. 165-45.000.
O'Connor, John A., III; Holland, Warren E.; Burley, James D.; Rogers, Ronald D.; Watkins, Fred E.; and Terral, Ben D., to Exxon Production Research Co. Circulating valve for wells. 4,360,064, Cl. 166-319.000.
Odagiri, Minoru: *See*—
Ukai, Mikio; Odagiri, Minoru; Sugiura, Hidemi; and Hatanaka, Yasunori, 4,360,209, Cl. 464-175.000.
Odenwalder, Heinrich; Vetter, Hans; Janssens, Wilhelmus; and Jacken, Jan, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material containing non-diffusing electron donor compounds. 4,360,581, Cl. 430-218.000.
Oehler, Dorothy Z., to Conoco Inc. Method for relating shallow electrical anomalies to the presence of deeper hydrocarbon reservoirs. 4,360,359, Cl. 23-230.0EP.
Oepen, Heinrich: *See*—
Schnell, Axel; and Oepen, Heinrich, 4,359,892, Cl. 73-105.000.
Oestreich, Ulrich, to Siemens Aktiengesellschaft. Device for covering stranding elements. 4,359,857, Cl. 57-18.000.
Ohara, Shozo; and Ichinose, Toshio, to Nikkiso, Co. Ltd. Pulsatile blood pump. 4,360,324, Cl. 417-388.000.
Ohashi, Koichi: *See*—
Kamio, Kunimasa; Okuno, Koichi; Haraguchi, Satoru; Yamaguchi, Hiroyuki; and Ohashi, Koichi, 4,360,649, Cl. 525-484.000.
Ohba, Masahiro, to Nippondenso Co., Ltd. Injector drive circuit. 4,360,855, Cl. 361-154.000.
Ohba, Masahiro; Ito, Kenzo; Akiyama, Susumu; Hirabayashi, Yuuji; Hirano, Satoshi; and Ooka, Naoto, to Nippondenso Co., Ltd. Electronic ignition control apparatus. 4,360,874, Cl. 364-431.040.
O'Herron, Frances A.: *See*—
Balitz, David M.; Bush, James A.; O'Herron, Frances A.; and Nettleton, Donald E., Jr., 4,360,595, Cl. 435-119.000.
Ohkuma, Hiroaki: *See*—
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,360,458, Cl. 260-112.50R.
Ohmori, Takashi: *See*—
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,360,818, Cl. 346-76.0PH.
Ohsaka, Sigeo: *See*—
Fujiwara, Takao; Hanamitsu, Kiyoshi; Ohsaka, Sigeo; Ishikawa, Hiroshi; Takagi, Nobuyuki; and Segi, Katsuharu, 4,360,919, Cl. 372-45.000.
Ohta, Toshiro: *See*—
Asai, Toshio; Ohta, Toshiro; Shimizu, Kunio; and Nakazawa, Tetsuji, 4,360,846, Cl. 360-137.000.
Ohtani, Masami, to Diesel Kiki Company, Ltd. Automotive air conditioning apparatus. 4,359,875, Cl. 62-133.000.
Ohtsuka, Eizo: *See*—
Toyoshima, Isao; and Ohtsuka, Eizo, 4,360,754, Cl. 310-366.000.
Ohura, Toshio, to Nippon Electric Co., Ltd. Pattern display system. 4,360,804, Cl. 340-703.000.
Oka, Naoki; Tanaka, Nobuo; and Ando, Takashi, to Idemitsu Kosan Co., Ltd. Process for selectively aggregating coal powder. 4,360,422, Cl. 209-5.000.
Okada, Kazuya: *See*—
Ikeda, Minoru; Okada, Kazuya; Matsumura, Hiroshi; and Tachihata, Takeichi, 4,360,406, Cl. 203-32.000.
Okada, Kunihiro; Endo, Takeyuki; Yabuuchi, Shigeru; Funo, Takakazu; Kodama, Kazuyuki; and Shibuya, Yasutaka, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Figure displaying device. 4,360,884, Cl. 364-521.000.
Okado, Yosuke; Kawamura, Masanori; and Tomioka, Takashi, to Bridgestone Tire Company Limited. Rubber composition comprising furnace carbon black. 4,360,627, Cl. 524-496.000.
O'Keefe, James M.: *See*—
Osborne, William E.; Burns, Arthur H., Jr.; and O'Keefe, James M., 4,359,810, Cl. 29-1.100.
Okino, Eizo: *See*—
Kimura, Osamu; Kojima, Takashi; Okino, Eizo; and Nagasaki, Hideo, 4,360,621, Cl. 524-255.000.
Okuno, Koichi: *See*—
Kamio, Kunimasa; Okuno, Koichi; Haraguchi, Satoru; Yamaguchi, Hiroyuki; and Ohashi, Koichi, 4,360,649, Cl. 525-484.000.
Olashaw, William F., to General Electric Company. Modular insulative support base for electrical switchgear. 4,360,857, Cl. 361-361.000.
Olenberg, Harry: *See*—
Brown, James H.; and Olenberg, Harry, 4,360,387, Cl. 106-243.000.
Olin Corporation: *See*—
Wojtowicz, John A.; and Farmer, Douglas A., Jr., 4,360,671, Cl. 544-192.000.
Olivo, Amando D. Cover for sealing open mouth of a container. 4,360,119, Cl. 220-23.000.
Olsen, Clayton E.: *See*—
Steyert, William A.; and Olsen, Clayton E., 4,360,569, Cl. 428-566.000.
Olson, Leonard. Vortex wind turbine. 4,360,315, Cl. 416-41.000.
Olsson, Mats A.; and Sandstrom, Roland, to Mats Olsson Konsult AB. Low-frequency sound generator. 4,359,962, Cl. 116-137.00R.
Olympia Werke AG: *See*—
von Knorre, Karl-Friedrich; Tillich, Peter; and Herbermann, Gottfried, 4,360,806, Cl. 340-792.000.
Olympus Optical Company Ltd.: *See*—
Hashimoto, Akihiko, 4,360,258, Cl. 354-195.000.
OMEX: *See*—
Forster, Alette J.; and Ockers, Muriel M., 4,360,820, Cl. 346-135.100.
Omodei-Sale, Amedeo; and Toia, Emilio, to Gruppo Lepetit S.p.A. Naphth[1,2-d]imidazoles. 4,360,674, Cl. 546-199.000.
Omron Tateisi Electronics Co.: *See*—
Suzuki, Yasuo; and Sakamoto, Nobuyoshi, 4,360,872, Cl. 364-405.000.
Onishi, Soichi; and Kitano, Shigeru, to Sharp Kabushiki Kaisha. Data processor for recording and reading out check data and true data in a cassette tape. 4,360,842, Cl. 360-25.000.
Onksen, Peter J.; Hundley, Robert G., deceased; and Hundley, Francine, heiress, to Pacer Systems, Inc. Omnidirectional airspeed system. 4,360,888, Cl. 364-565.000.
Ono, Syoji; Fukumoto, Yuji; and Yoshida, Tsunemasa, to Teijin Limited; and Chemo-Sero-Therapeutic Research Institute, The. S-Sulfonated immunoglobulin composition having a high monomer content and a process for production thereof. 4,360,457, Cl. 260-112.00B.

Ooka, Naoto: *See*—
Ohba, Masahiro; Ito, Kenzo; Akiyama, Susumu; Hirabayashi, Yuuji; Hirano, Satoshi; and Ooka, Naoto, 4,360,874, Cl. 364-431.040.
Optelecom, Inc.: *See*—
Schmadel, Donald; Culver, William H.; and Gould, Gordon, 4,360,272, Cl. 356-352.000.
Orcon Corporation: *See*—
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,360,555, Cl. 428-107.000.
Organon Teknika Corporation: *See*—
McArthur, Mary J.; Marantz, Laurence B.; and Scarbrough, Abb L., 4,360,507, Cl. 423-419.00P.
Orillo, Stephen, Jr.: *See*—
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, 4,359,917, Cl. 82-4.00R.
Orlowski, Jan A., to Scientific Pharmaceuticals, Inc. 1,4-Bis[(3'-methacroyl-2'-hydroxypropoxy)methyl]cyclohexane derivatives thereof. 4,360,693, Cl. 560-220.000.
Ortho Pharmaceutical Corporation: *See*—
Kanojia, Ramesh M., 4,360,467, Cl. 549-397.000.
Ortner, Herbert; Pfalzer, Lother; and Fischer, Siegbert, to J. M. Voith GmbH. Process and apparatus for preparing waste paper for reuse. 4,360,402, Cl. 162-5.000.
Osborne, Shelly M.: *See*—
Evans, Walter R.; Murphree, Gary R.; and Osborne, Shelly M., 4,359,886, Cl. 70-366.000.
Osborne, William E.; Burns, Arthur H., Jr.; and O'Keefe, James M., to Marlin Firearms Company, The. Method of forming cartridge chambers in firearm barrels. 4,359,810, Cl. 29-1.100.
Oscar Mayer Foods Corporation: *See*—
Adkison, Frank L.; and Kress, Jack L., 4,359,807, Cl. 17-1.00R.
Oshima, Akio: *See*—
Tsuchiya, Shozo; Oshima, Akio; and Hayshi, Hideo, 4,360,622, Cl. 524-275.000.
Osting, Helen L. Wheel glide. 4,360,210, Cl. 280-13.000.
Ostrowski, John S.: *See*—
Castellucci, Nicholas T.; Grunewalder, John F.; and Ostrowski, John S., 4,360,614, Cl. 523-421.000.
Otagiri, Tadashi; Watanabe, Tetsuo; and Mase, Syunzo, to NGK Insulators, Ltd. Zirconia ceramics and a method of producing the same. 4,360,598, Cl. 501-103.000.
Otis Engineering Corporation: *See*—
Kilgore, Marion D., 4,360,063, Cl. 166-317.000.
Ott, Karl-Heinz: *See*—
Lindner, Christian; Liebig, Lothar; and Ott, Karl-Heinz, 4,360,620, Cl. 524-234.000.
Otto Niederer Sons, Inc.: *See*—
Niederer, Lee H.; and Niederer, Thomas O., 4,360,099, Cl. 198-424.000.
Ovshinsky, Herbert: *See*—
Klose, Peter; and Ovshinsky, Herbert, 4,360,579, Cl. 430-8.000.
Owen, Douglas B., to D. W. Zimmerman Mfg., Inc. Fluid driven successive stage bladder pump. 4,360,320, Cl. 417-244.000.
Owens-Corning Fiberglas Corporation: *See*—
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,360,473, Cl. 260-429.500.
Miller, Donald R., 4,359,873, Cl. 62-63.000.
Owens-Illinois, Inc.: *See*—
Heider, James E., 4,360,556, Cl. 428-131.000.
Stengle, Edward J., 4,360,563, Cl. 428-323.000.
Tobias, John W.; and Taylor, Lynn J., 4,360,606, Cl. 523-124.000.
Owens, Phillip J., to Thoroughbred Plastics Corp. Linerless bottle cap. 4,360,114, Cl. 215-329.000.
Ozawa, Isao; Nagai, Yutaka; and Menjo, Yoshihiro, to Toyoda Gosei Co., Ltd. Molding. 4,360,549, Cl. 428-31.000.
Pacer Systems, Inc.: *See*—
Onksen, Peter J.; Hundley, Robert G., deceased; and Hundley, Francine, heiress, 4,360,888, Cl. 364-565.000.
Pachmayr, Frank A.; and Farrar, Jack R., to Pachmayr Gun Works, Inc. Reinforced cushioning grip for pistols. 4,359,833, Cl. 42-71.00P.
Pachmayr Gun Works, Inc.: *See*—
Pachmayr, Frank A.; and Farrar, Jack R., 4,359,833, Cl. 42-71.00P.
Pacific Measurements, Inc.: *See*—
Yasumura, Gary; Genin, Robert D.; and Wetenkamp, Scott F., 4,360,865, Cl. 363-126.000.
Pack, Roy E., Jr.: *See*—
Soth, J. Michael; and Pack, Roy E., Jr., 4,360,156, Cl. 239-11.000.
Paget, Win. Compressor. 4,360,319, Cl. 417-238.000.
Pagilagan, Rolando U., to Du Pont de Nemours, E. I., and Company. Flame-retardant polyamide compositions. 4,360,616, Cl. 524-100.000.
Palmer, Leonard H. Spring assembly for a tumbling board. 4,360,197, Cl. 272-65.000.
Palmersheim, Gerard M.; and Breeding, Robert D., to Warner & Swasey Company, The. Regenerative and anticavitation hydraulic system for an excavator. 4,359,931, Cl. 91-436.000.
Pandzik, Richard T.: *See*—
Copp, Carl A., Jr.; Pandzik, Richard T.; and Gaines, Marvin E., 4,360,321, Cl. 417-269.000.
Pape, Klaus: *See*—
Ruhnau, Garhard; Pape, Klaus; and Auding, Rudolf, 4,360,918, Cl. 371-69.000.
Paper Converting Machine Company: *See*—
Bradley, John J., 4,360,194, Cl. 270-51.000.
Paque, Michael W., to Kroy Inc. Printing apparatus having interchangeable large character type fonts and tape-ribbon cartridge therefor. 4,360,278, Cl. 400-134.300.
Parcels, J. Roy: *See*—
Irvine, James E. B.; and Parcels, J. Roy, 4,360,106, Cl. 206-621.000.
Parenti, Frank V.: *See*—
Skees, Hugh B.; and Parenti, Frank V., 4,360,548, Cl. 428-29.000.
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Substituted phenoxyphenyl pyridazones, their preparation, and their use as herbicides. 4,360,672, Cl. 544-240.000.
Paris, Rene A.; and Grollier-Baron, Therese, to Societe Europeenne des Produits Refractaires. Method of preparing sialon products. 4,360,506, Cl. 423-327.000.
Park, Young W., to Korea Institute of Science and Technology. High-temperature storage battery. 4,360,574, Cl. 429-94.000.
Parker, John J.: *See*—
Fouss, James L.; Parker, John J.; Child, James L., Jr.; and Sting, Donald W., 4,360,042, Cl. 138-119.000.
Parquet, Donald J., to J. I. Case Company. Hydraulic anti-theft device. 4,360,074, Cl. 180-287.000.
Parsons, Richard E.: *See*—
Wood, Richard L.; Casamajor, Alan B.; and Parsons, Richard E., 4,360,230, Cl. 294-86.00A.
Pascon, Claude; and Marcellin, Georges, to Societe Anonyme dite: Compagnie Generale d'Electricite. Lead accumulator. 4,360,576, Cl. 429-143.000.
Patchett, Arthur A., to Merck & Co., Inc. Glyceryl ester of 1-methyl-2-(3,4-dihydroxyphenyl)alanine. 4,360,533, Cl. 424-309.000.
Patrie, Jos: *See*—
Ladet, Michel; Lefevre, Jacques; and Patrie, Jos, 4,360,411, Cl. 204-33.000.
Patterson, David L.: *See*—
Gubitose, Nicholas F.; Schuler, Malcolm R.; and Patterson, David L., 4,360,499, Cl. 422-246.000.
Paul Judy & Associates: *See*—
Judy, Paul E.; and Hoffman, John A., 4,359,948, Cl. 108-56.100.
Paul, Volker: *See*—
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Pendergast, Joseph P., to General Motors Corporation. Shock absorber with deflector for high pressure rebound oil. 4,360,085, Cl. 188-315.000.
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Pinto, Anthony A. Automatic theft and fire alarm apparatus for fire extinguishers. 4,360,802, Cl. 340-568.000.
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Raschbichler, Hans-Georg; and Breitenbach, Otto, to Kabel-und Metallwerke Gutehoffnungshutte AG; and Thyssen Industrie Aktiengesellschaft. Polyphase stator system for a linear motor. 4,360,748, Cl. 310-13.000.
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Marker, Wolfgang; Muller, Klaus; and Roller, Wilhelm, 4,360,496, Cl. 376-298.000.

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Roto Form Sales Corp.: *See*—
Baldwin, Wilbur A.; and Silverman, Richard, 4,360,095, Cl. 193-40.000.

Roullet, Robert: *See*—
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,360,561, Cl. 428-288.000.

Rounsley, Robert R., to Mead Corporation, The. Drying system. 4,359,826, Cl. 34-1.000.

Rovee, David T.; Marvel, John R.; and Mezick, James A., to Johnson & Johnson. Topical anti-inflammatory drug therapy. 4,360,518, Cl. 424-240.000.

Rowan, Eugene V.; and Farmer, Homer H., to R. T. Vanderbilt Company, Inc. Organomolybdenum based additives and lubricating compositions containing same. 4,360,438, Cl. 252-33.600.

Rowland, Bobby A.; Sullivan, Roy E.; Dodson, William R.; and Bohannon, Steve C., to Southwire Company. Method of and apparatus for lubricating cable during continuous dry curing. 4,360,492, Cl. 264-40.100.

RTE-ASEA Corporation: *See*—
Harris, David L.; Elwing, Daniel T.; and Jones, Howard T., 4,360,849, Cl. 361-39.000.

Rubens, Louis C., to Dow Chemical Company, The. Pressurization and storage of thermoplastic resin foams prior to secondary expansion. 4,360,484, Cl. 264-28.000.

Rudwick, Lawrence A.; and Schuman, Steven A. Sport type wheel chair. 4,360,213, Cl. 280-242.0WC.

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Runavot, Yves; Billault, Georges; and Salvetat, Jacques, to National Starch and Chemical Corporation. Copolymer tackifying resins containing dicyclopentadine, vinyl aromatic hydrocarbon and a substituted benzene (halogen, lower alkyl, or hydroxyl) and adhesives containing these resins. 4,360,628, Cl. 524-508.000.

Rutledge, Russell P.: *See*—
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Ryan, John O., to Ampex Corporation. Voltage controlled subcarrier phase shifter. 4,360,747, Cl. 307-511.000.

Ryan, Kenneth M.: *See*—
Cvetovich, Raymond J.; Melillo, David G.; Ryan, Kenneth M.; and Sletzinger, Meyer, 4,360,684, Cl. 549-291.000.

Rysti, Alpo. Method and apparatus for locating spacer strips between layers of timber packages. 4,360,303, Cl. 414-42.000.

Rzeszewski, Theodore S., to Matsushita Electric Corporation. Frequency synthesizer tuning system for television receivers. 4,360,832, Cl. 358-191.100.

SAB Harmon Industries, Inc.: *See*—
Wilde, Calvin D.; and Turner, Daniel L., 4,360,873, Cl. 364-426.000.

Sabee Products, Inc.: *See*—
Sabee, Reinhardt N., 4,360,398, Cl. 156-164.000.

Sabee, Reinhardt N., to Sabee Products, Inc. Method for applying elastic bands to webs. 4,360,398, Cl. 156-164.000.

Sachtleben, Sandra G.; and Kirkland, John R., to Aluminum Company of America. Method for increasing resistance to treeing in polymeric insulating layer. 4,360,539, Cl. 427-8.000.

Sada, Kenzo; and Watashi, Mitsuo, to Kubota, Ltd. Tractor transmission. 4,360,091, Cl. 192-4.00B.

Sahar, Abraham: *See*—
Levy, Itshak; Ron, Samuel; Sahar, Abraham; and Wolowelsky, Jehoshua, 4,360,007, Cl. 128-1.00R.

Saito, Takashi; Shigenobu, Michio; Kuge, Tsukasa; Sakurai, Masaaki; and Adachi, Hiroyuki, to Canon Kabushiki Kaisha. Fixing device. 4,359,963, Cl. 118-60.000.

Saito, Tamio; Fukumoto, Yoshikatsu; and Tagaya, Kiyomi, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal recording apparatus. 4,360,819, Cl. 346-76.0PH.

Sakaguchi, Kouichi: *See*—
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Sakai, Fumihide: *See*—
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,360,458, Cl. 260-112.50R.

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Howard, Velmar E.; Klett, Keith K.; Sammann, Ernest A.; and Verdeyen, Joseph T., 4,360,850, Cl. 361-56.000.

Samuel, David N.; and Sinnott, Kenneth M., to W. R. Grace & Co. Sealing compositions. 4,360,120, Cl. 524-494.000.

Sandoz Ltd.: *See*—
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Sandrock, Gary D.: *See*—
Sheridan, John J., III; Eisenberg, Fred G.; Sandrock, Gary D.; Huston, Ernest L.; Snape, Edwin; Stickles, Raymond P.; and Cheng, Gordon C., 4,360,505, Cl. 423-248.000.

Sandstrom, Roland: *See*—
Olsson, Mats A.; and Sandstrom, Roland, 4,359,962, Cl. 116-137.00R.

Sanguiol, Jean-Pierre: *See*—
Pihery, Jean-Rene; Sanguiol, Jean-Pierre; and Turlet, Michel, 4,359,814, Cl. 29-568.000.

Sano, Frank M.; Golden, Edward J.; and Sliwa, Robert A., to Bendix Corporation, The. Weapon firing system including weapon interrogation means and stray voltage testing means. 4,359,926, Cl. 89-1.814.

Sare, Edward J.: *See*—
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Sargent, Charles F.: *See*—
Segal, Joshua L.; and Sargent, Charles F., 4,360,910, Cl. 370-62.000.

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Bechtiger, Charles G.; and Miller, James C., 4,359,883, Cl. 70-269.000.
Evans, Walter R.; Murphree, Gary R.; and Osborne, Shelly M., 4,359,886, Cl. 70-366.000.

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Steck, Werner; Roller, Hermann; Sarnecki, Wilhelm; and Balz, Werner, 4,360,377, Cl. 75-0.5AA.

Sarrine, Robert J., to Transidyne General Corp. Blood collecting device. 4,360,016, Cl. 128-763.000.

Sasaki, Kan: *See*—
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,360,094, Cl. 192-53.00F.

Sasano, Akira: *See*—
Tsukada, Toshihisa; Maruyama, Eiichi; Baji, Toru; Ataka, Saburo; Imamura, Yoshinori; Sasano, Akira; Kubo, Masaharu; Koike, Norio; and Nagahara, Shusaku, 4,360,821, Cl. 357-31.000.

Satake, Kunio: *See*—
Taguchi, Tadashi; Fujikawa, Noboru; Kohno, Mitsuo; Yoshitake, Katsumi; and Satake, Kunio, 4,360,582, Cl. 430-260.000.

Sato, Hideo: *See*—
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Sato, Koichi: *See*—
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,360,375, Cl. 71-88.000.

Sato, Toshiyuki; and Kanno, Nobuyuki, to Yamaha Hatsudoki Kabushiki Kaisha. Tricycle with two fore wheels. 4,360,224, Cl. 280-772.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Printing device. 4,359,939, Cl. 101-288.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Ink supply devices for portable labeling machine. 4,359,940, Cl. 101-295.000.

Satzler, Ronald L., to Caterpillar Tractor Co. Scrap removal apparatus. 4,360,312, Cl. 414-741.000.

Satzler, Ronald L., to Caterpillar Tractor Co. Lift fixture. 4,360,313, Cl. 414-781.000.

Sauer, Joseph: *See*—
Muller, Alfred; and Sauer, Joseph, 4,360,092, Cl. 192-12.00C.
Sauer, L. Peter; and Gurak, Ronald W., to Signode Corporation. Method and apparatus for pre-draping an object receiving station with flexible binding. 4,359,936, Cl. 100-2.000.
Saunders, George D. Sectional multi-purpose cargo container. 4,360,115, Cl. 220-1.500.
Sauron, Georges: *See*—
Mauduit, Daniel; and Sauron, Georges, 4,360,775, Cl. 324-210.000.
Sauter, Hubert: *See*—
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Savage, Frances H.: *See*—
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Sawada, Satoru: *See*—
Kojima, Tetsuro; Morigaki, Masakazu; Hamaoka, Tsutomu; and Sawada, Satoru, 4,360,589, Cl. 430-551.000.
Sawamoto, Kunifumi: *See*—
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Sawyer, Quentan T., to General Electric Company. High rate of fire revolving battery gun. 4,359,928, Cl. 89-12.000.
Scarbrough, Abb L.: *See*—
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Scardapane, Anthony N.: *See*—
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Schaaf, Wayne J.; and Boswell, Bennie J., to Chromalloy American Corporation. Transport lock system for an implement or the like. 4,360,067, Cl. 172-413.000.
Schachar, Ronald A. Medical office construction. 4,359,843, Cl. 52-29.000.
Schade, Otto H., Jr., to RCA Corporation. Transistor amplifiers exhibiting low input offset potentials. 4,360,785, Cl. 330-261.000.
Schadlich, Fritz; Armbruster, Gerhard; Neubert, Werner; and Stierle, Peter, to Robert Bosch GmbH. Power driven, hand operated plane. 4,360,048, Cl. 145-4.000.
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Schaeffer, Howard J., to Burroughs Wellcome Co. Purine derivatives. 4,360,522, Cl. 424-253.000.
Scharf, Donald R.: *See*—
Vilagi, Burton J.; Scharf, Donald R.; and Macartney, Lawrence J., 4,360,132, Cl. 222-504.000.
Schaupp, Kurt: *See*—
Zabrocki, Karl; and Schaupp, Kurt, 4,360,452, Cl. 252-356.000.
Schedele, Helmut, to Siemens Aktiengesellschaft. Electromagnetic flat relay. 4,360,794, Cl. 335-202.000.
Scheineman, Betty J. Device and method for storing keys. 4,359,888, Cl. 70-457.000.
Schergen, Mark; and Armond, Joseph A., to Electro-Matic Products Co. Demagnetizing, variable frequency. 4,360,854, Cl. 361-149.000.
Schering Corporation: *See*—
Berger, Joel G.; and Tahbaz, Pirouz, 4,360,673, Cl. 546-70.000.
Schermann, Jean-Pierre: *See*—
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Scherr, Rudolf: *See*—
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Schiel, Christian, to J.M. Voith GmbH. Drying cylinder for paper making machine. 4,359,829, Cl. 34-124.000.
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Schlatter, Lester E.; and Miller, Steven J. Auxiliary heating system. 4,360,152, Cl. 237-13.000.
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Tanguy, Denis R.; and Leising, Larry J., 4,359,898, Cl. 73-151.000.
Schmadel, Donald; Culver, William H.; and Gould, Gordon, to Optelecom, Inc. Fiber optic energy sensor and optical demodulation system and methods of making same. 4,360,272, Cl. 356-352.000.
Schmale, Peter C.; and Blom, Hendrik, to U.S. Philips Corporation. Television camera comprising a television pick-up tube and an anti-microphonics circuit. 4,360,834, Cl. 358-217.000.
Schmehling, Gerhard, to Schmehling GmbH. Fastening element for hairpieces. 4,360,033, Cl. 132-53.000.
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Schmidlin, Albertus E., to United States of America, Army. Switch actuator. 4,359,942, Cl. 102-263.000.
Schmidt, Wolfram; Paust, Joachim; and Nurrenbach, Axel, to BASF Aktiengesellschaft. Preparation of N-(D)-ribityl-2-phenylazo-4,5-dimethylaniline. 4,360,669, Cl. 260-207.500.
Schmitt, Frederick L.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,360,032, Cl. 131-276.000.
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Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Gasser, Oswald, to Espe Fabrik pharmazeutischer Praparate GmbH. Mixing component for dental glass ionomer cements. 4,360,605, Cl. 523-116.000.
Schmolka, Irving R., to BASF Wyandotte Corporation. Amphoteric surfactant gels. 4,360,451, Cl. 252-316.000.
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Schneehage, Hans H.: *See*—
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Schnell, Axel; and Oepen, Heinrich, to U.S. Philips Corporation. Arrangement for measuring surface profiles. 4,359,892, Cl. 73-105.000.
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Schobinger, Alfred; Schwarz, Gunter; and Beig, Willy, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Switching mechanism for fluid-operated gear shifters. 4,360,718, Cl. 200-61.880.
Schon, Klaus-Peter; and Schmitt, Klaus, to Hoechst Aktiengesellschaft. Device for aligning and feeding an original. 4,360,195, Cl. 271-3.000.
Schoneweiss, Klaus, to O&K Orenstein & Koppel Aktiengesellschaft. Device for placing escalators in and out of operation. 4,360,078, Cl. 187-12.000.
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Ahlstrom, Ross C., Jr.; Johnson, Mark S.; Moore, Jerry P.; and Schoppe, Ivo R., Jr., 4,359,891, Cl. 73-23.100.
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Schuler, Malcolm R.: *See*—
Gubitose, Nicholas F.; Schuler, Malcolm R.; and Patterson, David L., 4,360,499, Cl. 422-246.000.
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Schwaab, Inc.: *See*—
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Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, to Xerox Corporation. Monolithic laser scanning device. 4,360,921, Cl. 372-50.000.
Scigalski, Gilbert. Offset vehicle axle. 4,360,212, Cl. 280-111.000.
SCM Corporation: *See*—
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Sedon, James H., to Dow Chemical Company, The. Process for making glycol ethers utilizing a heterogeneous catalyst. 4,360,698, Cl. 568-618.000.
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Senter, Robert; and Andrich, Millard. Pipe clamp. 4,360,178, Cl. 248-74.00R.
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Shannon, E. Paul. Motor having concentric ring rotor. 4,360,753, Cl. 310-93.000.
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Sharpe, Timothy E. Solar heat collector system. 4,360,005, Cl. 126-422.000.
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van der Burgt, Maarten J., 4,360,306, Cl. 414-217.000.
Ward, John M., 4,360,290, Cl. 405-170.000.
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Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., 4,360,448, Cl. 252-309.000.
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Chaput, Guy J.; and Sich, Edward M., 4,360,710, Cl. 179-81.00R.
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Beinvogl, Willy, 4,360,414, Cl. 204-192.00E.
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Fink, Manfred; and Haendle, Joerg, 4,360,731, Cl. 378-42.000.
Grassl, Hans-Peter, 4,360,256, Cl. 354-25.000.
Hahndorff, Axel, 4,360,757, Cl. 313-218.000.
Heise, Rudolf, 4,360,790, Cl. 331-114.000.
Oestreich, Ulrich, 4,359,857, Cl. 57-18.000.
Schedele, Helmut, 4,360,794, Cl. 335-202.000.
Schneider, Hartmut; and Grabmaier, Josef, 4,360,546, Cl. 427-255.000.
Seifert, Gerd, 4,360,735, Cl. 378-134.000.
Stoeger, Klaus; Birkle, Siegfried; and Gehring, Johann, 4,360,409, Cl. 204-14.00N.
Waller, Siegfried, 4,360,878, Cl. 364-474.000.
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Sauer, L. Peter; and Gurak, Ronald W., 4,359,936, Cl. 100-2.000.
Sikdar, Subhas K., to General Electric Company. Non-catalyzed interfacial polycondensation polycarbonate process. 4,360,659, Cl. 528-196.000.
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Mendola, Charles F., 4,360,235, Cl. 299-18.000.
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Wakimoto, Saburo; Miyahara, Sadayasu; and Hyosu, Yoshihiko, 4,360,611, Cl. 523-216.000.
Sinnott, Kenneth M.: *See*—
Samuel, David N.; and Sinnott, Kenneth M., 4,360,120, Cl. 524-494.000.
Skees, Hugh B.; and Parenti, Frank V., to Standard Register Company, The. Self-contained covert image. 4,360,548, Cl. 428-29.000.
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Slemon, Charles S., to Tetra-Tech, Inc. Optical feedthrough for pressure vessels. 4,360,249, Cl. 350-96.180.
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Cvetovich, Raymond J.; Melillo, David G.; Ryan, Kenneth M.; and Sletzinger, Meyer, 4,360,684, Cl. 549-291.000.
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Gifford, John F.; Sliger, Edward; and Leal, Joaquin, 4,360,308, Cl. 414-572.000.
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Sano, Frank M.; Golden, Edward J.; and Sliwa, Robert A., 4,359,926, Cl. 89-1.814.
Slonim, David M. Ocean wave energy converter. 4,359,868, Cl. 60-501.000.
Small, Thomas R., to Johns Hopkins University, The. Superflywheel energy storage device. 4,359,912, Cl. 74-572.000.
Smearing, Robert W., to General Electric Company. Storage stable reactive peroxide paste composition. 4,360,446, Cl. 252-428.000.
Smerdov, Andrei A.: *See*—
Venin, Igor V.; Gonopolsky, Oleg L.; Zhuk, Valery P.; Rodionov, Vladimir I.; Smerdov, Andrei A.; and Tischenko, Alexandr G., 4,360,026, Cl. 128-419.00D.
Smiltneek, Ralmond J. Die-cutting mechanism. 4,359,918, Cl. 83-236.000.
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Knaus, Ernest; Namsick, Raymond J.; and Smith, Herbert D., 4,360,124, Cl. 220-452.000.
Smith International Inc.: *See*—
Cove, Harry R.; and Muchow, John D., 4,360,040, Cl. 137-625.300.
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Brabbs, William J.; Savage, Frances H.; and Smith, James P., 4,360,534, Cl. 426-560.000.
Smith, Jay, III; and Moskin, Jeffrey M., to Smith Engineering. Radio control apparatus with voice transmission capability. 4,360,808, Cl. 340-825.690.
Smith, Joseph C.: *See*—
Rocco, Harold S.; and Smith, Joseph C., 4,360,096, Cl. 198-345.000.
Smulkstys, Louis S.: *See*—
Selkey, Fred C.; and Smulkstys, Louis S., 4,360,769, Cl. 318-601.000.
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Sheridan, John J., III; Eisenberg, Fred G.; Sandrock, Gary D.; Huston, Ernest L.; Snape, Edwin; Stickles, Raymond P.; and Cheng, Gordon C., 4,360,505, Cl. 423-248.000.
Sochor, Josef, to Robert Bosch GmbH. Circuit for producing timing pulses in the regeneration of square signals. 4,360,781, Cl. 328-120.000.
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Caretta, Renato, 4,360,397, Cl. 156-134.000.
Societe Anonyme dite, Compagnie Generale d'Automatise: *See*—
Lehmann, Roger, 4,360,727, Cl. 235-441.000.
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Pascon, Claude; and Marcellin, Georges, 4,360,576, Cl. 429-143.000.
Societe Anonyme France-Atlas: *See*—
Coelus, Gaspar, 4,359,890, Cl. 73-12.000.
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Ladet, Michel; Lefevre, Jacques; and Patrie, Jos, 4,360,411, Cl. 204-33.000.
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Paris, Rene A.; and Grollier-Baron, Therese, 4,360,506, Cl. 423-327.000.
Sogo, Yoshitaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Transmission. 4,359,909, Cl. 74-467.000.
Sol-Optics, Inc.: *See*—
Solomon, Charles I., 4,360,252, Cl. 351-95.000.
Solar Search Corporation: *See*—
Warnock, Stuart E., 4,360,006, Cl. 126-449.000.
Solarex Corporation: *See*—
Koval, Timothy D., 4,360,393, Cl. 148-171.000.
Solomon, Charles I., to Sol-Optics, Inc. Eyeglass frame having removable lens. 4,360,252, Cl. 351-95.000.
Somraty, Thomas P. Rotating piston engine with constant torque arm drive of its power take-off shaft. 4,359,980, Cl. 123-245.000.
Sone, Kohki: *See*—
Masaki, Kenji; Sone, Kohki; and Takase, Sadao, 4,359,989, Cl. 123-438.000.
Sony Corporation: *See*—
Asai, Toshio; Ohta, Toshiro; Shimizu, Kunio; and Nakazawa, Tetsuji, 4,360,846, Cl. 360-137.000.
Menezes, William A.; Kuper, Douglas D.; and Wheeler, David, 4,360,843, Cl. 360-72.200.
Mita, Michio, 4,360,841, Cl. 360-13.000.
Sorathia, Usman A. K.: *See*—
Gagliani, John; Lee, Raymond; and Sorathia, Usman A. K., 4,360,604, Cl. 521-189.000.
Soth, J. Michael; and Pack, Roy E., Jr., to Delavan Corporation. Fluid metering and spraying. 4,360,156, Cl. 239-11.000.
Southwire Company: *See*—
Rowland, Bobby A.; Sullivan, Roy E.; Dodson, William R.; and Bohannon, Steve C., 4,360,492, Cl. 264-40.100.
Spademan, Richard G. Step-in electrical releasable ski binding. 4,360,218, Cl. 280-624.000.
Spademan, Richard G. Ski release binding with rearwardly movable clamping member. 4,360,219, Cl. 280-624.000.
Spectradyne, Incorporated: *See*—
Briggs, Robert S., Jr.; and Porter, James W., 4,360,828, Cl. 358-86.000.
Spencer, John E.; and Bhattacharya, Ashok K., to General Electric Company. Metal halide lamp containing ThI_4 with added elemental cadmium or zinc. 4,360,756, Cl. 313-179.000.
Spencertown Geo-Solar Associates: *See*—
O'Connell, Thomas F., 4,360,056, Cl. 165-45.000.
Sperner, Franz; Aldinger, Fritz; and Zwergel, Wilhelm, to W. C. Heraeus GmbH. Heater plug for diesel engines. 4,359,977, Cl. 123-145.00A.
Sperry Corporation: *See*—
Askov, Alan R.; and Butler, L. Dennis, 4,360,302, Cl. 414-24.500.
Branigin, Michael H.; Cubranich, Ladislaw D.; and Henderson, Edward E., 4,360,891, Cl. 364-900.000.
Metz, Louis C.; and Prohofsky, Leroy A., 4,360,912, Cl. 370-96.000.
Thaxter, James B., 4,360,273, Cl. 356-354.000.
Spitnale, Gregory G.: *See*—
Lemanski, Michael F.; Spitnale, Gregory G.; and Milberger, Ernest C., 4,360,453, Cl. 252-435.000.
Sprague, B. Sheldon: *See*—
Reger, Arie; and Sprague, B. Sheldon, 4,360,417, Cl. 204-290.00R.
Sprague, Peter W.: *See*—
Haslanger, Martin F.; and Sprague, Peter W., 4,360,685, Cl. 549-386.000.
Srivastava, Gopal K., to Zenith Radio Corporation. Vertical drive generator and horizontal rate gate generator for a television receiver. 4,360,825, Cl. 358-20.000.
Stal-Laval Turbin AB: *See*—
Hansson, Hans-Erik, 4,360,349, Cl. 440-75.000.
Stanbrook, Frank C.: *See*—
Brokaw, Paul E.; Adeboi, Frans L.; Feimer, Bryan A.; Freeman, James G.; Kawolics, Raymond P.; and Stanbrook, Frank C., 4,360,129, Cl. 222-146.00H.
Standard Oil Company, The: *See*—
Lemanski, Michael F.; Spitnale, Gregory G.; and Milberger, Ernest C., 4,360,453, Cl. 252-435.000.
Standard Oil Company (Indiana): *See*—
Nimry, Tayseer S.; and Fields, Ellis K., 4,360,657, Cl. 528-188.000.
Standard Register Company, The: *See*—
Hall, Byron C., 4,360,356, Cl. 493-459.000.
Skees, Hugh B.; and Parenti, Frank V., 4,360,548, Cl. 428-29.000.
Stangl, Ludwig: *See*—
Frommlet, Hubert; and Stangl, Ludwig, 4,360,337, Cl. 416-141.000.
Stanley, Philip E.; Cushing, David E.; and Taylor, Donald R., to Honeywell Information Systems Inc. Control store organization for a data processing system. 4,360,869, Cl. 364-200.000.
Stauffer Chemical Company: *See*—
Silberberg, Joseph, 4,360,636, Cl. 525-64.000.
Stearns, Charles F., to United Technologies Corporation. Negative rate compensated hydraulic servo system. 4,359,929, Cl. 91-47.000.
Steck, Werner; Roller, Hermann; Sarnecki, Wilhelm; and Balz, Werner, to BASF Aktiengesellschaft. Ferromagnetic metal particles, consisting essentially of iron and carrying a surface coating, and their production. 4,360,377, Cl. 75-0.5AA.
Steele, Harry C. Compression compensator. 4,359,976, Cl. 123-78.00B.
Steiner, Frederick, to Piessey Overseas Limited. Magnetic electro-acoustic transducer construction. 4,360,711, Cl. 179-115.00R.
Stelson, Thomas S.: *See*—
Barth, Charles F.; Stelson, Thomas S.; and Blake, David E., 4,359,841, Cl. 51-325.000.
Stelzer, Roland: *See*—
Rappange, Adelbert; Robert, Richard; and Stelzer, Roland, 4,360,207, Cl. 277-22.000.
Stemer, Jacques: *See*—
Kaplan, Murray A.; Bouzard, Daniel; Perol, Claude; Stemer, Jacques; and Weber, Abraham, 4,360,523, Cl. 424-257.000.
Stemmler, Kurt: *See*—
Fuchs, Siegfried; and Stemmler, Kurt, 4,359,919, Cl. 83-349.000.

Stendel, Wilhelm: *See*—
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,360,690, Cl. 560-57.000.

Stengle, Edward J., to Owens-Illinois, Inc. Composite material surface for handling hot glass. 4,360,563, Cl. 428-323.000.

Stephenson, Earle W.; and Hutzell, Clyde G., to Kennametal Inc. Furrowing tool. 4,360,068, Cl. 172-540.000.

Stephenson, Robert L.: *See*—
Thomas, Rudy V.; Stephenson, Robert L.; and Frantom, Richard L., 4,360,225, Cl. 280-804.000.

Stern, James J. Self-mating pizza pie container. 4,360,118, Cl. 220-4.00E.

Stevens, Henry C.; Sare, Edward J.; and Holtman, Mark S., to PPG Industries, Inc. Polymerizate of (allyl carbonate) and aliphatic polyurethane having acrylic unsaturation. 4,360,653, Cl. 526-301.000.

Stevens, Samuel B.; and Kizer, Richard W., to Caterpillar Tractor Co. Cable tensioning and applying apparatus. 4,360,169, Cl. 242-4.0BE.

Stewart, Robert D., to Foster Wheeler Energy Corporation. Fluidized bed heat exchanger utilizing a baffle system. 4,359,968, Cl. 122-4.00D.

Stewart, William S.; and Funk, Gary L., to Phillips Petroleum Company. Process control system. 4,360,882, Cl. 364-494.000.

Steyert, William A.; and Olsen, Clayton E., to United States of America, Energy. Porous metal hydride composite and preparation and uses thereof. 4,360,569, Cl. 428-566.000.

Stickles, Raymond P.: *See*—
Sheridan, John J., III; Eisenberg, Fred G.; Sandrock, Gary D.; Huston, Ernest L.; Snape, Edwin; Stickles, Raymond P.; and Cheng, Gordon C., 4,360,505, Cl. 423-248.000.

Stiennon, Patrick J. G. Aircraft overpressure trap. 4,359,944, Cl. 102-405.000.

Stierle, Peter: *See*—
Schadlich, Fritz; Armbruster, Gerhard; Neubert, Werner; and Stierle, Peter, 4,360,048, Cl. 145-4.000.

Stima, Joseph F., to Colgate-Palmolive Company. Absorbent article. 4,360,021, Cl. 128-287.000.

Sting, Donald W.: *See*—
Fouss, James L.; Parker, John J.; Child, James L., Jr.; and Sting, Donald W., 4,360,042, Cl. 138-119.000.

Stjerna, Sven, to ASEA Aktiebolag. Block brake assembly for the wheel of a railway vehicle. 4,360,084, Cl. 188-242.000.

Stoeger, Klaus; Birkle, Siegfried; and Gehring, Johann, to Siemens Aktiengesellschaft. Apparatus for the galvanic deposition of aluminum. 4,360,409, Cl. 204-14.00N.

Stoepel, Kurt: *See*—
Meyer, Horst; Franckowiak, Gerhard; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,360,520, Cl. 424-250.000.

Stokes, John H. Solid state control device for gradually turning on and off an electrical load. 4,360,743, Cl. 307-252.00B.

Stolzer, Paul, to KEURO Maschinenbau GmbH & Co. KG. Double-acting cylinder-piston unit for a mechanical frame saw. 4,359,921, Cl. 83-756.000.

Stolzer, Paul, to KEURO Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft. Guide arrangement for the saw frame of a mechanical frame saw. 4,359,922, Cl. 83-759.000.

Strass, Wilfried, to Linde Aktiengesellschaft. Method of and apparatus for the cooling of natural gas. 4,359,871, Cl. 60-648.000.

Strasser, Frederick G.; and Horwinski, Elwood R., to Gulf & Western Manufacturing Company. Nautical light. 4,360,862, Cl. 362-240.000.

Streifer, William: *See*—
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,360,921, Cl. 372-50.000.

Streit, Philip N.; and Leininger, Lyle E. Sanitary waste grease disposal apparatus. 4,360,046, Cl. 141-82.000.

Struger, Odo J.; and Brown, Ronald A., to Allen-Bradley Company. Multiplexing I/O module. 4,360,913, Cl. 370-112.000.

Stumpp, Gerhard; Walz, Ludwig; Schielinsky, Gerhard; Wessel, Wolf; Kuttner, Thomas; Flaig, Ulrich; Piwonka, Fridolin; Eisele, Hermann; Boehringer, Andreas; Kubach, Hans; Locher, Johannes; and Becker, Waldemar, to Robert Bosch GmbH. Method and apparatus for fuel metering in internal combustion engines. 4,359,991, Cl. 123-478.000.

Stype, Robert D., to Dresser Industries, Inc. Wet electrostatic precipitator having a deflector trough arrangement. 4,360,365, Cl. 55-119.000.

Sueddeutsche Kuehlerfabrik julius fr. behr GmbH & Co. KG: *See*—
Muellejans, Herbert, 4,360,058, Cl. 165-104.210.

Sugimoto, Hitoshi: *See*—
Kubota, Yutaka; and Sugimoto, Hitoshi, 4,360,765, Cl. 315-209.00M.

Sugino, Takashi: *See*—
Wada, Masaru; Shimizu, Hirokazu; Sugino, Takashi; and Itoh, Kunio, 4,360,920, Cl. 372-45.000.

Sugita, Keiichiro; and Nemoto, Gunji, to Mizuho Ika Kogyo Kabushiki Kaisha. Cerebral aneurysm clip. 4,360,023, Cl. 128-325.000.

Sugiura, Hidemi: *See*—
Ukai, Mikio; Odagiri, Minoru; Sugiura, Hidemi; and Hatanaka, Yasunori, 4,360,209, Cl. 464-175.000.

Sugiura, Toshiro, to Brother Kogyo Kabushiki Kaisha. Printing paper feeding mechanism. 4,360,279, Cl. 400-600.200.

Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,360,165, Cl. 239-703.000.

Sullivan, Herbert D., to International Harvester Co. Tank cap having sequential engagement and disengagement. 4,360,122, Cl. 220-295.000.

Sullivan, Roy E.: *See*—
Rowland, Bobby A.; Sullivan, Roy E.; Dodson, William R.; and Bohannon, Steve C., 4,360,492, Cl. 264-40.100.

Sumitomo Chemical Company, Limited: *See*—
Kamio, Kunimasa; Okuno, Koichi; Haraguchi, Satoru; Yamaguchi, Hiroyuki; and Ohashi, Koichi, 4,360,649, Cl. 525-484.000.
Kimura, Osamu; Kojima, Takashi; Okino, Eizo; and Nagasaki, Hideo, 4,360,621, Cl. 524-255.000.

Sumitomo Electric Industries, Ltd.: *See*—
Suzuki, Fumio, 4,360,395, Cl. 156-54.000.

Sumitomo Metal Industries, Ltd.: *See*—
Tarutani, Yoshio; Moroishi, Taishi; and Koike, Masao, 4,360,381, Cl. 75-126.00F.

Sumitomo Rubber Industries, Ltd.: *See*—
Nakasaki, Eiji, 4,360,050, Cl. 152-354.00R.

Summers, James W.: *See*—
Nehmey, Samuel D.; and Summers, James W., 4,360,602, Cl. 521-95.000.

Sun Metal Products, Inc.: *See*—
West, Wilson, 4,360,335, Cl. 425-450.100.

Sunbeam Plastics Corporation: *See*—
Luker, Edward, 4,360,113, Cl. 215-216.000.

Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Substituted chromans. 4,360,532, Cl. 424-283.000.

Suominen, Heikki S. Adhesive envelope for a shipping label or the like. 4,360,355, Cl. 493-196.000.

Suyama, Eizo, to Nihon Rajieeta Kabushiki Kaisha (Nihon Radiator Co., Ltd.). Muffler. 4,360,076, Cl. 181-265.000.

Suzuki, Fumio, to Sumitomo Electric Industries, Ltd. Method for producing a laminated sheath. 4,360,395, Cl. 156-54.000.

Suzuki, Naohito: *See*—
Maruyama, Eisuke; Kobayashi, Hiromitsu; Mitsuhashi, Masakazu; Takeuchi, Hiromichi; Futamura, Yoshiki; and Suzuki, Naohito, 4,360,127, Cl. 222-14.000.

Suzuki, Satomi: *See*—
Numazawa, Akio; Koga, Hideaki; and Suzuki, Satomi, 4,359,910, Cl. 74-476.000.

Suzuki, Seiichi: *See*—
Endo, Yasushi; and Suzuki, Seiichi, 4,360,562, Cl. 428-317.700.

Suzuki, Toshikazu: *See*—
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,360,165, Cl. 239-703.000.

Suzuki, Yasuo; and Sakamoto, Nobuyoshi, to Omron Tateisi Electronics Co. Electronic cash register system. 4,360,872, Cl. 364-405.000.

Suzuki, Yasushi: *See*—
Tsukamoto, Kunio; Suzuki, Yasushi; Izumi, Akihiro; and Hiramatsu, Yoshio, 4,360,464, Cl. 548-490.000.

Swank, Harry R.: *See*—
Kreidler, James F.; Neuber, Ralph E.; and Swank, Harry R., 4,360,837, Cl. 358-246.000.

Swanson, Larry: *See*—
Hagan, John D.; Swanson, Larry; and Anderson, David E., 4,360,041, Cl. 138-89.000.

Swanson, William C., to International Harvester Co. Seat accumulator clutch booster assist. 4,359,867, Cl. 60-413.000.

Swart, Daniel J.; and Kelyman, Jacqueline S., to Dow Chemical Co., The. Alternating copolyestercarbonate resins. 4,360,656, Cl. 528-176.000.

Swartz, Jerome; Harrison, Shelley A.; Barkan, Edward; Delfine, Frank; and Brown, George, to Symbol Technologies, Inc. Portable laser scanning arrangement for and method of evaluating and validating bar code symbols. 4,360,798, Cl. 340-146.3AG.

Sweger, Theodore J.: *See*—
Nadherny, Rudolph E.; and Sweger, Theodore J., 4,360,299, Cl. 410-34.000.
Nadherny, Rudolph E.; and Sweger, Theodore J., 4,360,300, Cl. 410-34.000.

Syma Intercontinental AG: *See*—
Beer, Heinz, 4,360,286, Cl. 403-201.000.

Symbol Technologies, Inc.: *See*—
Swartz, Jerome; Harrison, Shelley A.; Barkan, Edward; Delfine, Frank; and Brown, George, 4,360,798, Cl. 340-146.3AG.

Syntex (U.S.A.) Inc.: *See*—
Alsup, J. Douglas, Jr.; and Jenkins, Arden F., 4,360,281, Cl. 403-4.000.

Synthes AG: *See*—
Cordey, Jacque R., 4,359,906, Cl. 73-862.230.

Sysko, Robert J., to Pfizer Inc. Pure 6,6-diiodopenicillanic acid and process for its preparation. 4,360,463, Cl. 260-245.20R.

Szmuszkovicz, Jacob: *See*—
McMillan, Moses W.; and Szmuszkovicz, Jacob, 4,360,531, Cl. 424-274.000.

Tachihata, Takeichi: *See*—
Ikeda, Minoru; Okada, Kazuya; Matsumura, Hiroshi; and Tachihata, Takeichi, 4,360,406, Cl. 203-32.000.

Tadanier, John S.; Martin, Jerry R.; and Collum, Paulette, to Abbott Laboratories. 2-Deoxyfortimicin A, 4-N-alkyl and 4-N-acyl-2-deoxyfortimicin B derivatives and intermediates therefor. 4,360,666, Cl. 536-16.100.

Tadanier, John S.; Martin, Jerry R.; and Collum, Paulette, to Abbott Laboratories. (1,2',6'-Tri-N-(2-O-methanesulfonylsalicylidine)-4,5-(2-O-methanesulfonylsalicylaldehyde) oxazolidine-2-O-methanesulfonylfortimicin B. 4,360,667, Cl. 536-16.100.

Tadanier, John S.: *See*—
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,360,668, Cl. 536-16.100.

Tagaya, Kiyomi: *See*—
Saito, Tamio; Fukumoto, Yoshikatsu; and Tagaya, Kiyomi, 4,360,819, Cl. 346-76.0PH.

Taguchi, Tadashi; Fujikawa, Noboru; Kohno, Mitsuo; Yoshitake, Katsumi; and Satake, Kunio, to Asahi Kasei Kogyo Kabushiki Kaisha. Photopolymerizable element comprising a soluble or dispersible oriented film support. 4,360,582, Cl. 430-260.000.

Taguchi, Teruaki: *See*—
Asakura, Hiroshi; Chimura, Ippei; Taguchi, Teruaki; and Minagawa, Renzo, 4,360,550, Cl. 428-35.000.

Taguchi, Tetsu; and Ochiai, Kazuo, to Nippon Electric Co., Ltd. Speech processor having speech analyzer and synthesizer. 4,360,708, Cl. 179-15.55R.

Tahbaz, Pirouz: *See*—
Berger, Joel G.; and Tahbaz, Pirouz, 4,360,673, Cl. 546-70.000.

Tajima, Osamu; Yamamura, Takashi; Mochizuki, Masafumi; and Mita, Yoichi, to Victor Company of Japan, Ltd. Case for a disc-shaped recording medium. 4,360,845, Cl. 360-133.000.

Tajima, Osamu, to Victor Company of Japan Ltd. Signal pickup device in a rotary recording medium reproducing apparatus. 4,360,909, Cl. 369-170.000.

Takagi, Nobuyuki: *See*—
Fujiwara, Takao; Hanamitsu, Kiyoshi; Ohsaka, Sigeo; Ishikawa, Hiroshi; Takagi, Nobuyuki; and Segi, Katsuharu, 4,360,919, Cl. 372-45.000.

Takahashi, Ichiro: *See*—
Miyoshi, Yoshitake; Fujii, Jiro; Nakanishi, Tsugio; Takahashi, Ichiro; Tsudaka, Hideaki; and Kai, Masami, 4,360,263, Cl. 355-29.000.

Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, to Nippon Piston Ring Co., Ltd. Abrasion resistant sintered alloy for internal combustion engines. 4,360,383, Cl. 75-236.000.

Takahashi, Nobuaki; Nishikawa, Kazunori; Masuda, Isao; and Sato, Hideo, to Victor Company of Japan, Ltd. Systems for recording both information and pilot signals directly on recording medium. 4,360,824, Cl. 358-323.000.

Takahashi, Yasuyuki: *See*—
Mimura, Akio; Takahashi, Yasuyuki; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,360,594, Cl. 435-108.000.

Takanashi, Itsuo: *See*—
Miyazaki, Kenichi; Miyoshi, Tadayoshi; Takanashi, Itsuo; Nakagaki, Shintaro; Motoyama, Koichiro; Yokokawa, Sumio; and Ichimura, Hiroshi, 4,360,826, Cl. 358-44.000.

Takase, Sadao: *See*—
Masaki, Kenji; Sone, Kohki; and Takase, Sadao, 4,359,989, Cl. 123-438.000.

Takayama, Shuichi: *See*—
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,360,375, Cl. 71-88.000.

Takayama, Takeshi: *See*—
Watarai, Shu; Ishii, Kazuo; and Takayama, Takeshi, 4,360,660, Cl. 528-266.000.

Takeda Chemical Industries, Ltd.: *See*—
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,360,462, Cl. 260-239.30P.

Takeshita, Masajiro: *See*—
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,360,383, Cl. 75-236.000.

Takeshita, Tetsuo: *See*—
Hamazato, Kazuo; Kitano, Junjiro; and Takeshita, Tetsuo, 4,360,709, Cl. 179-18.0FA.

Takeuchi, Hiromichi: *See*—
Maruyama, Eisuke; Kobayashi, Hiromitsu; Mitsuhashi, Masakazu; Takeuchi, Hiromichi; Futamura, Yoshiki; and Suzuki, Naohito, 4,360,127, Cl. 222-14.000.

Takeuchi, Satoshi, to Dai Nippon Insatsu Kabushiki Kaisha. Contact printing method and apparatus. 4,360,266, Cl. 355-91.000.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; and Tatsuta, Kuniaki, 4,360,664, Cl. 536-6.400.

Tamburoni, Giancarlo: *See*—
Beccalori, Ferruccio; Corvi, Gianguido; Merli, Giovanni; Tamburoni, Giancarlo; and Tamburoni, Lorenzo, 4,360,167, Cl. 241-101.00A.

Tamburoni, Lorenzo: *See*—
Beccalori, Ferruccio; Corvi, Gianguido; Merli, Giovanni; Tamburoni, Giancarlo; and Tamburoni, Lorenzo, 4,360,167, Cl. 241-101.00A.

Tamura, Hideyuki: *See*—
Asano, Masaharu; Tamura, Hideyuki; and Furuhashi, Shoji, 4,359,992, Cl. 123-480.000.

Tamura, Humio: *See*—
Asano, Kiro; Tamura, Humio; Tanaka, Hiromitsu; and Enomoto, Satoru, 4,360,663, Cl. 536-5.000.

Tamura, Koichi, to Tokico Ltd. Caliper brake structure to facilitate changing of brake elements. 4,360,080, Cl. 188-73.330.

Tamura, Koichi: *See*—
Haraikawa, Tetsuo; Ito, Hiroshi; and Tamura, Koichi, 4,360,082, Cl. 188-73.450.
Ito, Hiroshi; and Tamura, Koichi, 4,360,081, Cl. 188-73.380.

Tan, Chee-Teck; Howard, Gail P.; and Turner, Earl W., to International Telephone and Telegraph Corporation. Lipoprotein emulsions for food use and methods for preparing the same. 4,360,537, Cl. 426-656.000.

Tanaka, Hiromitsu: *See*—
Asano, Kiro; Tamura, Humio; Tanaka, Hiromitsu; and Enomoto, Satoru, 4,360,663, Cl. 536-5.000.

Tanaka, Nobuo: *See*—
Oka, Naoki; Tanaka, Nobuo; and Ando, Takashi, 4,360,422, Cl. 209-5.000.

Tanguy, Denis R.; and Leising, Larry J., to Schlumberger Technology Corporation. Weight-on-bit and torque measuring apparatus. 4,359,898, Cl. 73-151.000.

Tani, Yoshiki: *See*—
Yamada, Hideaki; Shimizu, Sakayu; Tani, Yoshiki; and Yamashita, Kanzo, 4,360,591, Cl. 435-4.000.

Tanida, Seiichi: *See*—
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,360,462, Cl. 260-239.30P.

Taniguchi, Fumikazu: *See*—
Maeda, Yoshinobu; Taniguchi, Fumikazu; and Narikiyo, Kazuhiko, 4,360,043, Cl. 140-105.000.

Tardot, Jacques, to L'Etat Francais represente por le Deleque Ministeriel pour l'Armement. Automatic means for ejecting a payload from its container. 4,360,117, Cl. 220-4.00R.

Tarutani, Yoshio; Moroishi, Taishi; and Koike, Masao, to Sumitomo Metal Industries, Ltd.; and Nippon Stainless Steel Co., Ltd. Ferritic stainless steel having good corrosion resistance. 4,360,381, Cl. 75-126.00F.

Tassie, Douglas P., to General Electric Company. High rate of fire revolving battery gun. 4,359,927, Cl. 89-12.000.

Tate, Jimmy W. Pick-up head for surface cleaning apparatus. 4,359,801, Cl. 15-346.000.

Tate, Takao: *See*—
Yoshioka, Mamoru; and Tate, Takao, 4,359,982, Cl. 123-320.000.

Tatsuta, Kuniaki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; and Tatsuta, Kuniaki, 4,360,664, Cl. 536-6.400.

Taylor, Brian E. Semiconductor switching circuits. 4,360,744, Cl. 307-254.000.

Taylor, Donald R.: *See*—
Stanley, Philip E.; Cushing, David E.; and Taylor, Donald R., 4,360,869, Cl. 364-200.000.

Taylor, Lynn J.: *See*—
Tobias, John W.; and Taylor, Lynn J., 4,360,606, Cl. 523-124.000.

Taylor, William A.: *See*—
Emanuelson, Roger C.; Luoma, Warren L.; and Taylor, William A., 4,360,485, Cl. 264-29.500.

TDK Electronics Co., Ltd.: *See*—
Shoji, Shigemasa, 4,360,173, Cl. 242-199.000.
Yamamoto, Seiichiro; Adachi, Hiromi; and Iwaya, Shoichi, 4,360,762, Cl. 315-101.000.

Technical Manufacturing Corporation: *See*—
Reid, Willis J., III, 4,360,184, Cl. 248-573.000.

Tecumseh Products Company: *See*—
Kaufman, Vernon R., 4,360,481, Cl. 261-39.00R.

Teijin Limited: *See*—
Kawaguchi, Takeyuki; Minematsu, Hiroyoshi; Hayashi, Yuzuru; Hara, Shigeyoshi; and Ueda, Fumio, 4,360,434, Cl. 210-500.200.
Ono, Syoji; Fukumoto, Yuji; and Yoshida, Tsunemasa, 4,360,457, Cl. 260-112.00B.

Teikoku Hormone Mfg. Co. Ltd.: *See*—
Tsukamoto, Kunio; Suzuki, Yasushi; Izumi, Akihiro; and Hiramatsu, Yoshio, 4,360,464, Cl. 548-490.000.

Telefonaktiebolaget L M Ericsson: *See*—
Hedin, Jan S.; and Jarnestedt, Goran A., 4,360,926, Cl. 375-120.000.

Temco Products, Inc.: *See*—
Thomas, Morton I., 4,359,791, Cl. 4-546.000.

Terakura, Yukio: *See*—
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,360,094, Cl. 192-53.00F.

Terral, Ben D.: *See*—
O'Connor, John A., III; Holland, Warren E.; Burley, James D.; Rogers, Ronald D.; Watkins, Fred E.; and Terral, Ben D., 4,360,064, Cl. 166-319.000.

Terrell Machine Company, The: *See*—
Kieronski, John P., 4,360,432, Cl. 210-402.000.
Niederer, Kurt W., 4,360,369, Cl. 55-283.000.

Testolini, Giovanni. Floating solar collector. 4,360,004, Cl. 126-415.000.

Tetra-Tech, Inc.: *See*—
Slemon, Charles S., 4,360,249, Cl. 350-96.180.

Texaco Inc.: *See*—
Love, Richard F.; Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,360,454, Cl. 252-465.000.
Virk, Kashmir S.; and Alperstein, Martin, 4,359,862, Cl. 60-274.000.
Virk, Kashmir S.; and Burns, Robert B., 4,359,863, Cl. 60-297.000.

Texas Instruments Incorporated: *See*—
Bate, Robert T., 4,360,900, Cl. 365-184.000.
Chapman, Richard A.; Lewis, Adam J., Jr.; Hynecek, Jaroslav; and Kinch, Michael A., 4,360,732, Cl. 250-332.000.
Dimyan, Magid Y.; and Castro, Carlos A., 4,360,899, Cl. 365-171.000.
Fiorella, Charles M., 4,360,716, Cl. 200-5.00A.
Norris, Jerry L.; and Hartman, Clinton S., 4,360,791, Cl. 333-165.000.

Textron, Inc.: *See*—
Fontaine, Raymond C., 4,359,808, Cl. 24-71.00R.

Thaxter, James B., to Sperry Corporation. Optical alignment of masks for X-ray lithography. 4,360,273, Cl. 356-354.000.

Thayer, William J., III; and Artura, Carmine J., to Boeing Company, The. Reagent tailoring for a chemical gas laser to obtain uniform initial chemical reaction rate. 4,360,923, Cl. 372-89.000.

Thiokol Corporation: *See—*
Kirchoff, George F., 4,360,223, Cl. 280-729.000.
Wade, Robert C.; Guilbault, Lawrence J.; and Rei, Nuno M., 4,360,623, Cl. 524-404.000.

Thir, Basil: *See—*
Cuddy, William A.; Thir, Basil; and Eisenstein, Stephen E., 4,360,144, Cl. 228-180.00R.

Thomas, Keith V., to Weyerhaeuser Company. High speed paper drying. 4,359,827, Cl. 34-16.000.

Thomas, Keith V., to Weyerhaeuser Company. Vacuum box for use in high speed papermaking. 4,359,828, Cl. 34-114.000.

Thomas, Morton I., to Temco Products, Inc. Folding transfer bench with improved roller and arm assembly. 4,359,791, Cl. 4-546.000.

Thomas, Rudy V.; Stephenson, Robert L.; and Frantom, Richard L., to Allied Corporation. Passive seat belt system. 4,360,225, Cl. 280-804.000.

Thompson, E. Arthur. Fire array and apparatus. 4,360,001, Cl. 126-164.000.

Thompson, William E.: *See—*
Perrella, Guido; and Thompson, William E., 4,360,054, Cl. 164-269.000.

Thomson-CSF: *See—*
Cornet, Jean, 4,360,895, Cl. 365-127.000.
Dalencon, Claude, 4,360,559, Cl. 428-174.000.
Girault, Herve; Reymond, Jean C.; and Cauzan, Pierre, 4,360,876, Cl. 364-449.000.

Thornton, William A., Jr.; Larson, Daniel A.; and Chen, Edward, to Westinghouse Electric Corp. High-intensity-discharge lamp of the mercury-metal halide type which efficiently illuminates objects with excellent color appearance. 4,360,758, Cl. 313-227.000.

Thoroughbred Plastics Corp.: *See—*
Owens, Phillip J., 4,360,114, Cl. 215-329.000.

Thorsrud, Agmund K.; and Siedenstrang, Roy W., to Phillips Petroleum Company. Microwave energy sensitizing concentrate. 4,360,607, Cl. 523-137.000.

Thyssen Industrie Aktiengesellschaft: *See—*
Raschbichler, Hans-Georg; and Breitenbach, Otto, 4,360,748, Cl. 310-13.000.

Tieman, Charles H., to Shell Oil Company. Preparation of α-cyanobenzyl esters. 4,360,478, Cl. 260-465.00D.

Tieman, Charles H., to Shell Oil Company. α-Halobenzyl esters. 4,360,689, Cl. 560-55.000.

Tillich, Peter: *See—*
von Knorre, Karl-Friedrich; Tillich, Peter; and Herbermann, Gottfried, 4,360,806, Cl. 340-792.000.

Tinsley, William B.; and Bacon, C. Richard. Swivel joint. 4,360,186, Cl. 251-1.00B.

Tischenko, Alexandr G.: *See—*
Venin, Igor V.; Gonopolsky, Oleg L.; Zhuk, Valery P.; Rodionov, Vladimir I.; Smerdov, Andrei A.; and Tischenko, Alexandr G., 4,360,026, Cl. 128-419.00D.

Tischer, Werner, to Zahnradfabrik Friedrichshafen, AG. Rotatable controller system. 4,359,866, Cl. 60-384.000.

Titus, James W., to United States of America, Navy. High-agility reflector support and drive system. 4,360,182, Cl. 248-371.000.

Tobias, John W.; and Taylor, Lynn J., to Owens-Illinois, Inc. Photodegradable polymer compositions. 4,360,606, Cl. 523-124.000.

Tobias, Michael A., to Mobil Oil Corporation. Acrylic modified anionic water dispersible styrene allyl alcohol copolymers. 4,360,640, Cl. 525-301.000.

Tobias, Michael A., to Mobil Oil Corporation. Acrylic modified anionic water dispersible styrene hydroxyethyl (meth)acrylate copolymers. 4,360,641, Cl. 525-301.000.

Tobias, Michael A., to Mobil Oil Corporation. Acrylic modified anionic water dispersible styrene (meth)acrylonitrile copolymers. 4,360,642, Cl. 525-301.000.

Toepke, Ival: *See—*
Novak, William P.; Toepke, Ival; and White, John, 4,360,733, Cl. 250-361.00R.

Toia, Emilio: *See—*
Omodei-Sale, Amedeo; and Toia, Emilio, 4,360,674, Cl. 546-199.000.

Tokheim Corporation: *See—*
Langston, Earl M.; Moore, Charles W.; Malecki, Richard L.; and Bruot, Roger C., 4,360,877, Cl. 364-465.000.

Tokico Ltd.: *See—*
Haraikawa, Tetsuo; Ito, Hiroshi; and Tamura, Koichi, 4,360,082, Cl. 188-73.450.
Ishida, Kunio, 4,360,192, Cl. 267-64.280.
Ito, Hiroshi; and Tamura, Koichi, 4,360,081, Cl. 188-73.380.
Maruyama, Eisuke; Kobayashi, Hiromitsu; Mitsuhashi, Masakazu; Takeuchi, Hiromichi; Futamura, Yoshiki; and Suzuki, Naohito, 4,360,127, Cl. 222-14.000.
Tamura, Koichi, 4,360,080, Cl. 188-73.330.

Tokico Yuki Ltd.: *See—*
Maruyama, Eisuke; Kobayashi, Hiromitsu; Mitsuhashi, Masakazu; Takeuchi, Hiromichi; Futamura, Yoshiki; and Suzuki, Naohito, 4,360,127, Cl. 222-14.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Fukuda, Norisuke; and Mori, Leo, 4,360,723, Cl. 219-10.55B.
Iwamoto, Akito; and Sekizawa, Hidekazu, 4,360,269, Cl. 356-239.000.
Kohyama, Mitsuaki, 4,360,261, Cl. 355-3.00R.
Saito, Tamio; Fukumoto, Yoshikatsu; and Tagaya, Kiyomi, 4,360,819, Cl. 346-76.0PH.
Tomita, Seiji; and Yokoyama, Hideo, 4,360,174, Cl. 242-200.000.

Tomcufcik, Andrew S.: *See—*
Meyer, Walter E.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,360,466, Cl. 549-442.000.

Tominaga, Jiro; Shinada, Wataru; Murata, Wataru; and Ito, Masahiro, to Nippon Steel Corporation. Method for direct heat treating austenitic stainless steel wire rod. 4,360,390, Cl. 148-12.00B.

Tomioka, Takashi: *See—*
Okado, Yosuke; Kawamura, Masanori; and Tomioka, Takashi, 4,360,627, Cl. 524-496.000.

Tomita, Seiji; and Yokoyama, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Cassette tape recorder. 4,360,174, Cl. 242-200.000.

Tomka, Ivan, to Ciba-Geigy AG. Photographic material. 4,360,590, Cl. 430-642.000.

Toms, Steve D.: *See—*
Noutko, Theodore E.; Toms, Steve D.; and Light, David P., 4,360,848, Cl. 361-15.000.

Topic, Eugene F. Ignition system for internal combustion engines. 4,359,998, Cl. 123-606.000.

Topstone Industries, Inc.: *See—*
Goldberg, Mel, 4,360,134, Cl. 223-66.000.

Toray Silicone Co., Ltd.: *See—*
Shimizu, Koji; Watanabe, Toshio; and Hamada, Mitsuo, 4,360,566, Cl. 428-404.000.

Towart, Robertson: *See—*
Meyer, Horst; Franckowiak, Gerhard; Bossert, Friedrich; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; and Wehinger, Egbert, 4,360,520, Cl. 424-250.000.

Towmotor Corporation: *See—*
Reeves, Jerry L., 4,360,309, Cl. 414-671.000.

Toyo Kagaku Kabushiki Kaisha: *See—*
Asakura, Hiroshi; Chimura, Ippei; Taguchi, Teruaki; and Minagawa, Renzo, 4,360,550, Cl. 428-35.000.

Toyoda Gosei Co., Ltd.: *See—*
Ozawa, Isao; Nagai, Yutaka; and Menjo, Yoshihiro, 4,360,549, Cl. 428-31.000.
Ukai, Mikio; Odagiri, Minoru; Sugiura, Hidemi; and Hatanaka, Yasunori, 4,360,209, Cl. 464-175.000.

Toyoda, Kenichi, to Fujitsu Fanuc Limited. Machining center with a robot. 4,359,815, Cl. 29-568.000.

Toyoshima, Isao; and Ohtsuka, Eizo, to Murata Manufacturing Co., Ltd. Mode suppressed piezoelectric device. 4,360,754, Cl. 310-366.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ikemoto, Kazuhito; Katayama, Nobuaki; Terakura, Yukio; and Sasaki, Kan, 4,360,094, Cl. 192-53.00F.
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Motosugi, Katsuhiko, 4,359,981, Cl. 123-263.000.
Numazawa, Akio; Koga, Hideaki; and Suzuki, Satomi, 4,359,910, Cl. 74-476.000.
Sogo, Yoshitaka, 4,359,909, Cl. 74-467.000.
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,360,165, Cl. 239-703.000.
Ukai, Mikio; Odagiri, Minoru; Sugiura, Hidemi; and Hatanaka, Yasunori, 4,360,209, Cl. 464-175.000.
Yoshioka, Mamoru; and Tate, Takao, 4,359,982, Cl. 123-320.000.

Transidyne General Corp.: *See—*
Sarrine, Robert J., 4,360,016, Cl. 128-763.000.

Trask, Elwood G.: *See—*
Campbell, Frederick S.; Trask, Elwood G.; Gasior, Walter; and Phaneuf, Roland, 4,360,554, Cl. 428-91.000.

Trattner, Burton C.: *See—*
Johnson, Hugh G.; and Trattner, Burton C., 4,360,860, Cl. 362-192.000.

Travinski, A. Robert. Inflatable safety belt. 4,360,351, Cl. 441-94.000.

Treadwell, Stephen S.: *See—*
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,359,953, Cl. 112-121.110.

Trementozzi, Quirino A., to Monsanto Company. Low acrylonitrile content styrene-acrylonitrile polymers blended with polyphenylene oxide. 4,360,618, Cl. 524-141.000.

Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Use of hydrogenated derivatives of 2,6,6-trimethyl-cyclohexene derivatives in augmenting or enhancing the aroma or taste of smoking tobacco and smoking tobacco articles. 4,360,032, Cl. 131-276.000.

Trim-Gard Company Ltd.: *See—*
Goble, Charles M., 4,360,135, Cl. 224-42.080.

Triman Limited: *See—*
Collins, Roy S., 4,360,490, Cl. 264-249.000.

Trinkwalder, Joseph C., Jr., to Sherwood Selpac Corporation. Magnetically-operated valve. 4,360,038, Cl. 137-390.000.

Trumbull, Walter A.; and Williams, Angela J., to Dow Chemical Company, The. Agglomerate-free, bubble-free, high barrier vinylidene chloride polymer films and process of preparation. 4,360,612, Cl. 523-351.000.

TRW Inc.: *See—*
Barth, Charles F.; Stelson, Thomas S.; and Blake, David E., 4,359,841, Cl. 51-325.000.
Schnabel, J. William, 4,359,957, Cl. 114-20.00A.

Tsao, Utah, to Lummus Company, The. Process for fractionating close boiling components of a multi-component system. 4,360,405, Cl. 203-24.000.

Tsubakimoto-Morse Co., Ltd.: *See*—
Wakabayashi, Shozo; and Narita, Kinzo, 4,360,093, Cl. 192-41.00A.
Tsubuko, Kazuo; Matsubayashi, Kenichi; and Kurotori, Tsuneo, to Ricoh Co., Ltd. Liquid developer for use in electrostatic photography. 4,360,580, Cl. 430-137.000.
Tsuchiya, Shozo; Oshima, Akio; and Hayshi, Hideo, to Nippon Oil Co., Ltd. Hot melt adhesive compositions comprising hydrogenated resin and ethylene-polar vinylic compound copolymer or wax. 4,360,622, Cl. 524-275.000.
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Tsukada, Toshihisa; Maruyama, Eiichi; Baji, Toru; Ataka, Saburo; Imamura, Yoshinori; Sasano, Akira; Kubo, Masaharu; Koike, Norio; and Nagahara, Shusaku, to Hitachi, Ltd. Solid-state imaging device. 4,360,821, Cl. 357-31.000.
Tsukamoto, Kunio; Suzuki, Yasushi; Izumi, Akihiro; and Hiramatsu, Yoshio, to Teikoku Hormone Mfg. Co. Ltd. Process for production of 1-aryloxy-aminopropane derivatives. 4,360,464, Cl. 548-490.000.
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Tusim, Martin H., to Dow Chemical Company, The. Process for adding magnesium oxide to film forming vinylidene chloride copolymer compositions. 4,360,489, Cl. 264-211.000.
Ueda, Fumio: *See*—
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Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; and Tatsuta, Kuniaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Anthracycline glycoside 14-halo,4'-ether. 4,360,664, Cl. 536-6.400.
Underwood, Richard M.: *See*—
Brown, Jack E., Jr.; Christie, Christopher E.; Forney, Joseph M.; and Underwood, Richard M., 4,359,896, Cl. 73-146.000.
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Levy, Stephen, 4,360,755, Cl. 313-93.000.
Majerus, John N., 4,359,943, Cl. 102-309.000.
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Bryner, Joseph S., 4,359,840, Cl. 51-131.400.
Fenimore, Edward E.; and Cannon, Thomas M., 4,360,797, Cl. 340-146.30F.
Gavin, Donald A., 4,359,905, Cl. 73-644.000.
Kulkarny, Vijay A., 4,360,922, Cl. 372-59.000.
Landt, Jeremy A., 4,360,810, Cl. 343-6.50R.
McCoy, Lowell R., 4,360,578, Cl. 429-247.000.
Mendelsohn, Marshall H.; and Gruen, Dieter M., 4,360,445, Cl. 252-181.600.
Nagy, Charles K., 4,360,361, Cl. 48-77.000.
Pennell, William E., 4,360,314, Cl. 415-219.00A.
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DeMarco, Michael, 4,360,348, Cl. 440-67.000.
Eden, J. Gary, 4,360,924, Cl. 372-91.000.
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Rehfeldt, Karl H., 4,360,786, Cl. 330-254.000.
Roger, Bernard P., 4,360,822, Cl. 357-46.000.
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Upadek, Horst; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Preparation of 13-oxabicyclo[10.3.0]pentadecane. 4,360,468, Cl. 549-462.000.
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Urquhart, Andrew W., to General Electric Company. Zirconium alloy heat treatment process. 4,360,389, Cl. 148-11.50F.
Urushiyama, Goro, to Honda Giken Kogyo Kabushiki Kaisha. Air-leveling system for a vehicle. 4,360,191, Cl. 267-64.160.
Usami, Akira; Kotani, Motoharu; and Goda, Tomoko, to Daisel Kagaku Kogyo Kabushikikaisha; and Fuji Eizai Kabushikikaisha. Sanitary napkin. 4,360,022, Cl. 128-290.00R.
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Utah Power & Light Co.: *See*—
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Valeo: *See*—
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Vallance, James K.; and Rahnke, Christian J., to Ford Motor Company. Three cycle per revolution wave compression supercharger. 4,360,317, Cl. 417-64.000.
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Venin, Igor V.; Gonopolsky, Oleg L.; Zhuk, Valery P.; Rodionov, Vladimir I.; Smerdov, Andrei A.; and Tischenko, Alexandr G. Defibrillator. 4,360,026, Cl. 128-419.00D.
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Vidra, James D., to Johnson & Johnson Products Inc. Nonabrasive gel formulations of sulfonated poly(arylene ether sulfone) polymer dental plaque barriers. 4,360,512, Cl. 424-56.000.
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Voss, Richard J., to General Motors Corporation. Generator voltage regulator. 4,360,773, Cl. 322-28.000.
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Wada, Masaru; Shimizu, Hirokazu; Sugino, Takashi; and Itoh, Kunio, to Matsushita Electric Industrial Co., Ltd. Terraced substrate semiconductor laser. 4,360,920, Cl. 372-45.000.
Wade, Arthur W., to Gomaco, Inc. Canal paving machine. 4,360,293, Cl. 405-268.000.
Wade, Robert C.; Guilbault, Lawrence J.; and Rei, Nuno M., to Thiokol Corporation. Alkali metal borohydride concentrate useful as a stability improver. 4,360,623, Cl. 524-404.000.
Wagner, Ernest W., to Caterpillar Tractor Co. Torsion bar axle suspension. 4,360,221, Cl. 280-689.000.
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Wakimoto, Saburo; Miyahara, Sadayasu; and Hyosu, Yoshihiko, to Sinloihi Company Limited. Fine spherical polymer particles and process for the preparation thereof. 4,360,611, Cl. 523-216.000.
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Waller, Siegfried, to Siemens Aktiengesellschaft. Method for the library storage of a workpiece program for numerically controlled machine tools. 4,360,878, Cl. 364-474.000.
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Wang, Samuel S.; and Lewellyn, Morris E., to American Cyanamid Company. Addition agent composition. 4,360,615, Cl. 524-9.000.
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Welk, Steven, to Brown Boveri Electric Inc. Capacitor voltage and trip coil impedance sensor with high voltage isolation. 4,360,853, Cl. 361-115.000.
Wells, Donald H. Antenna loading device with series connected loading coils. 4,360,814, Cl. 343-750.000.
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Wheeler, David: *See*—
Menezes, William A.; Kuper, Douglas D.; and Wheeler, David, 4,360,843, Cl. 360-72.200.
Wheeler, Lionel H.; and Adair, James P. Pipe casing cutter. 4,359,820, Cl. 30-97.000.
White, Alan C.; and Edington, Edwin T., to John Wyeth & Brother Limited. Analgesic method using a morpholine compound. 4,360,519, Cl. 424-248.550.
White, David L., to Medtronic, Inc. Drug dispensing irrigatable electrode. 4,360,031, Cl. 128-786.000.
White, John: *See*—
Novak, William P.; Toepke, Ival; and White, John, 4,360,733, Cl. 250-361.00R.
White, Wilfrid G. Gravity adjusted compass. 4,359,823, Cl. 33-364.000.
Wichmann, Joseph K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., 4,360,471, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., 4,360,472, Cl. 260-397.200.
Wiemers, George H. Universally-positionable bilaterally-symmetrical three-cylinder-operated hitch. 4,360,216, Cl. 280-479.00R.
Wilcox, John F., to Champion International Corporation. Die-cut packing pad. 4,360,145, Cl. 229-1.50R.
Wilde, Calvin D.; and Turner, Daniel L., to SAB Harmon Industries, Inc. Power selection system for a consist of locomotives. 4,360,873, Cl. 364-426.000.
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, to United States of America, Navy. Portable on-site turning apparatus. 4,359,917, Cl. 82-4.00R.
Williams, Albert G., to Celanese Corporation. Continuous countercurrent extraction process for removing water-soluble impurities from water immiscible polymer solutions. 4,360,662, Cl. 528-499.000.
Williams, Angela J.: *See*—
Trumbull, Walter A.; and Williams, Angela J., 4,360,612, Cl. 523-351.000.
Williams, Donald L., to General Motors Corporation. Electromagnetic diesel fuel injector. 4,360,163, Cl. 239-533.500.
Williams, Eugene C.: *See*—
Andrews, Edward W.; and Williams, Eugene C., 4,360,805, Cl. 340-744.000.
Williams, James W.: *See*—
Bowen, William A.; and Williams, James W., 4,360,927, Cl. 455-17.000.
Williams, Lavada G. Food container. 4,360,105, Cl. 206-544.000.
Wilmot, Richard D.: *See*—
Cantwell, Thomas C., Jr.; Wilmot, Richard D.; and Ballantyne, Jack R., 4,360,811, Cl. 343-7.00A.
Wilson Greatbatch Ltd.: *See*—
Zayatz, Robert A., 4,359,818, Cl. 29-623.100.
Wilson, Raymond L.; and Dingwall, James A., to Edward Wilson & Son Limited. Skin categorizing apparatus. 4,360,887, Cl. 364-552.000.
Winchell, Harry S.: *See*—
Baldwin, Ronald M.; Lin, Tz-Hong; and Winchell, Harry S., 4,360,511, Cl. 424-1.500.
Winiasz, Michael E.: *See*—
McGill, Robert W.; and Winiasz, Michael E., 4,360,101, Cl. 198-461.000.
Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG: *See*—
Fuchs, Siegfried; and Stemmler, Kurt, 4,359,919, Cl. 83-349.000.
Wiremold Company, The: *See*—
Rogers, Wilfred R., 4,360,705, Cl. 174-48.000.
Wirthwein, Rolf: *See*—
Klenk, Herbert; Wirthwein, Rolf; Waldmann, Helmut; and Seifert, Hermann, 4,360,682, Cl. 549-266.000.
Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., 4,360,471, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; and Wichmann, Joseph K., 4,360,472, Cl. 260-397.200.
Wisneski, Peter M., to Gulf Oil Corporation. Polymer mixing apparatus. 4,360,044, Cl. 141-9.000.
Witthaus, Ira L. Electric sensor package. 4,360,856, Cl. 361-170.000.
Witzel, Homer D., to Chamberlain John Deere Pty. Ltd. Tractor drawn harvesting combine. 4,359,854, Cl. 56-228.000.
Wojtowicz, John A.; and Farmer, Douglas A., Jr., to Olin Corporation. Preparation of cyanuric acid. 4,360,671, Cl. 544-192.000.
Wolf, Horst, to Zinser Textilmaschinen GmbH. Method of and apparatus for winding a filament onto a bobbin. 4,359,858, Cl. 57-93.000.
Wolfes, Wilhelm H. O., to Proctor & Gamble Company, The. Concentrated textile treatment compositions and method for preparing them. 4,360,437, Cl. 252-8.800.
Wolff, George D.; and Ziemacki, Michael S. Needle position indicator for a fuel injector nozzle holder. 4,359,895, Cl. 73-119.00A.
Wolff, Paul A.: *See*—
Durant, Peter D.; and Wolff, Paul A., 4,359,958, Cl. 114-74.00A.
Wolfrum, Larry M.; and Barrett, Frederick C., to AM International, Inc. Real time data compression/decompression scheme for facsimile transmission system. 4,360,840, Cl. 358-261.000.
Wolowelsky, Jehoshua: *See*—
Levy, Itshak; Ron, Samuel; Sahar, Abraham; and Wolowelsky, Jehoshua, 4,360,007, Cl. 128-1.00R.
Wolters, Clemens A., to Clements Corp. Internal combustion engine utilizing particulate fuel. 4,359,970, Cl. 123-23.000.
Wonn, Quinby E., to General Motors Corporation. Torque reversal control valve for a torque converter clutch. 4,360,090, Cl. 192-3.300.
Wood, Richard L.; Casamajor, Alan B.; and Parsons, Richard E., to United States of America, Energy. Self locking coupling mechanism for engaging and moving a load. 4,360,230, Cl. 294-86.00A.
Woodford, Thomas E.: *See*—
Morin, William J., III; and Woodford, Thomas E., 4,359,907, Cl. 73-863.210.
Woolley, Francis L., Jr. Light polarizing lamination and system employing same. 4,359,832, Cl. 40-434.000.
Wootton, Gerald V.; Lane, Parley C., Jr.; and Yi, Kong S., to B. F. Goodrich Company, The. Nonsolvent preconcentration of polymeric cycloolefins. 4,360,629, Cl. 524-553.000.
World Resources Company: *See*—
Zarur, George L., 4,360,380, Cl. 75-97.00R.
Wovkulich, Peter M.: *See*—
Batcho, Andrew D.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,360,470, Cl. 260-397.100.
Wright, Neal A., to Diversified Air Products, Inc. Refrigeration system and novel heat exchanger therefor. 4,359,879, Cl. 62-513.000.
Wright, William E., to Ethyl Corporation. Process for preparing a 3-phenoxytoluene and diphenyl ether. 4,360,699, Cl. 568-635.000.
Wrobel, Joseph J.: *See*—
Howe, Dennis G.; and Wrobel, Joseph J., 4,360,908, Cl. 369-109.000.
Wuerzer, Bruno: *See*—
Parg, Adolf; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,360,672, Cl. 544-240.000.
Wursthorn, Karl R.: *See*—
Kugele, Thomas G.; Mesch, Keith A.; and Wursthorn, Karl R., 4,360,619, Cl. 524-181.000.
Wyatt, Kenneth L., to Western Electric Company, Inc. Safety glass mounted test result indicator. 4,360,253, Cl. 351-158.000.
Wykoff, Clyde R. Pneumatic tire and tire carcass, some having directional others having non-directional operational characteristics. 4,360,051, Cl. 152-356.00R.
Xerox Corporation: *See*—
Maiers, Michael A., 4,360,844, Cl. 360-99.000.
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,360,921, Cl. 372-50.000.
Yabuuchi, Shigeru: *See*—
Okada, Kunihiro; Endo, Takeyuki; Yabuuchi, Shigeru; Funo, Takakazu; Kodama, Kazuyuki; and Shibuya, Yasutaka, 4,360,884, Cl. 364-521.000.
Yagi, Hideo, to Kabushiki Kaisha Sunpak. Flash unit having plural flashlamps. 4,360,764, Cl. 315-151.000.

Yamada, Hideaki; Shimizu, Sakayu; Tani, Yoshiki; and Yamashita, Kanzo, to Amano Pharmaceutical Co., Ltd. Process for the determination of free fatty acids. 4,360,591, Cl. 435-4.000.

Yamaguchi, Hiroyuki: *See*—
Kamio, Kunimasa; Okuno, Koichi; Haraguchi, Satoru; Yamaguchi, Hiroyuki; and Ohashi, Koichi, 4,360,649, Cl. 525-484.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Nakao, Yasuo; and Norimatsu, Nobuo, 4,359,865, Cl. 60-313.000.
Sato, Toshiyuki; and Kanno, Nobuyuki, 4,360,224, Cl. 280-772.000.

Yamamoto, Seiichiro; Adachi, Hiromi; and Iwaya, Shoichi, to TDK Electronics Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Rapid starter switch for a fluorescent lamp. 4,360,762, Cl. 315-101.000.

Yamamura, Takamasa; Mori, Seiji; Asada, Koichi; Shinoda, Kenichi; and Higo, Yuichi, to Nisshin Steel Co., Ltd. Process for production of coil of hot rolled strip of austenitic stainless steel. 4,360,391, Cl. 148-12.00E.

Yamamura, Takashi, to Victor Company of Japan, Ltd. Disc-shaped recording medium reproducing apparatus. 4,360,907, Cl. 369-77.000.

Yamamura, Takashi: *See*—
Tajima, Osamu; Yamamura, Takashi; Mochizuki, Masafumi; and Mita, Yoichi, 4,360,845, Cl. 360-133.000.

Yamashita, Kanzo: *See*—
Yamada, Hideaki; Shimizu, Sakayu; Tani, Yoshiki; and Yamashita, Kanzo, 4,360,591, Cl. 435-4.000.

Yamato Scale Company, Ltd.: *See*—
Hirano, Takashi, 4,360,070, Cl. 177-25.000.

Yarnitzky, Chaim N.: *See*—
Peled, Emanuel; and Yarnitzky, Chaim N., 4,360,779, Cl. 324-434.000.

Yasumura, Gary; Genin, Robert D.; and Wetenkamp, Scott F., to Pacific Measurements, Inc. Broad band microwave detector. 4,360,865, Cl. 363-126.000.

Yeda Research and Development Co., Ltd.: *See*—
Levy, Itshak; Ron, Samuel; Sahar, Abraham; and Wolowelsky, Jehoshua, 4,360,007, Cl. 128-1.00R.

Yen, Huan-Wun: *See*—
Figueroa, Luis; Slayman, Charles W.; and Yen, Huan-Wun, 4,360,246, Cl. 350-96.120.

Yi, Kong S.: *See*—
Wootton, Gerald V.; Lane, Parley C., Jr.; and Yi, Kong S., 4,360,629, Cl. 524-553.000.

Yokokawa, Sumio: *See*—
Miyazaki, Kenichi; Miyoshi, Tadayoshi; Takanashi, Itsuo; Nakagaki, Shintaro; Motoyama, Koichiro; Yokokawa, Sumio; and Ichimura, Hiroshi, 4,360,826, Cl. 358-44.000.

Yokoyama, Hideo: *See*—
Tomita, Seiji; and Yokoyama, Hideo, 4,360,174, Cl. 242-200.000.

Yoshida, Hitoshi: *See*—
Igashira, Toshihiko; Yoshida, Hitoshi; Nomura, Ken; and Abe, Seiko, 4,359,974, Cl. 123-52.00M.

Yoshida, Tsunemasa: *See*—
Ono, Syoji; Fukumoto, Yuji; and Yoshida, Tsunemasa, 4,360,457, Cl. 260-112.00B.

Yoshioka, Mamoru; and Tate, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Throttle valve opening controller. 4,359,982, Cl. 123-320.000.

Yoshitake, Katsumi: *See*—
Taguchi, Tadashi; Fujikawa, Noboru; Kohno, Mitsuo; Yoshitake, Katsumi; and Satake, Kunio, 4,360,582, Cl. 430-260.000.

Young, Howard S.: *See*—
Dietl, Hans K.; and Young, Howard S., 4,360,469, Cl. 260-396.00R.

Young, Patricia A.: *See*—
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, 4,360,527, Cl. 424-269.000.

Youngs Drug Products Corporation: *See*—
Irvine, James E. B.; and Parcels, J. Roy, 4,360,106, Cl. 206-621.000.

Yuasa, Katsumi: *See*—
Mimura, Akio; Takahashi, Yasuyuki; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,360,594, Cl. 435-108.000.

Yuji, Kenji. Fishing float. 4,359,836, Cl. 43-44.900.

Zabrocki, Karl; and Schaupp, Kurt, to Bayer Aktiengesellschaft. Emulsifier composition. 4,360,452, Cl. 252-356.000.

Zahnradfabrik Friedrichshafen, AG: *See*—
Tischer, Werner, 4,359,866, Cl. 60-384.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Schobinger, Alfred; Schwarz, Gunter; and Beig, Willy, 4,360,718, Cl. 200-61.880.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; and Tatsuta, Kuniaki, 4,360,664, Cl. 536-6.400.

Zangenfeind, Helmut, to AGFA-Gevaert AG. Apparatus for removing exposed films and backing strips from cassettes. 4,360,138, Cl. 226-91.000.

Zarur, George L., to World Resources Company. Process for recovery of metal values from sludges. 4,360,380, Cl. 75-97.00R.

Zayatz, Robert A., to Wilson Greatbatch Ltd. Coated anode for lithium halogen cells. 4,359,818, Cl. 29-623.100.

Zeeh, Bernd; Pommer, Ernst-Heinrich; and Buschmann, Ernst, to BASF Aktiengesellschaft. Azolyl-acetophenone-oxime ethers. 4,360,526, Cl. 424-269.000.

Zeeh, Bernd: *See*—
Buschmann, Ernst; Schirmer, Ulrich; Zeeh, Bernd; Sauter, Hubert; and Jung, Johann, 4,360,465, Cl. 548-568.000.

Zenith Radio Corporation: *See*—
Babicz, Michael; Campisi, Carl; and Josephs, Joseph E., 4,360,838, Cl. 358-248.000.
Srivastava, Gopal K., 4,360,825, Cl. 358-20.000.

Zettergren, Ted. Device for remote control of hydraulic or pneumatic machine tools. 4,360,807, Cl. 340-825.200.

Zhuk, Valery P.: *See*—
Venin, Igor V.; Gonopolsky, Oleg L.; Zhuk, Valery P.; Rodionov, Vladimir I.; Smerdov, Andrei A.; and Tischenko, Alexandr G., 4,360,026, Cl. 128-419.00D.

Ziaylek, Theodore, Jr. Boat light having resiliently flexible and adjustable mount. 4,360,859, Cl. 362-80.000.

Ziels, Burton D., to Babcock & Wilcox Company, The. Sootblower feed and lance tube structure with improved turbulizer system. 4,359,800, Cl. 15-316.00R.

Ziemacki, Michael S.: *See*—
Wolff, George D.; and Ziemacki, Michael S., 4,359,895, Cl. 73-119.00A.

Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,359,858, Cl. 57-93.000.

Zucchi, Giorgio: *See*—
Bellicardi, Francesco; Zucchi, Giorgio; and Giusberti, Roberto, 4,360,164, Cl. 239-585.000.

Zucker, Joseph; and Fitch, Arthur H., to GTE Automatic Electric Labs Inc. Method and apparatus for measuring the insertion loss of a splice in an optical fiber. 4,360,268, Cl. 356-73.100.

Zundel, Andrew T., to Portable Tool & Electronics Inc. Electronic circuit breaker. 4,360,851, Cl. 361-59.000.

Zwergel, Wilhelm: *See*—
Sperner, Franz; Aldinger, Fritz; and Zwergel, Wilhelm, 4,359,977, Cl. 123-145.00A.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF NOVEMBER, 1982

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adamson, John S., to Chevron Research Company. Transducer system for continuous monitoring liquid levels in storage tanks and the like. Re. 31,089, Cl. 340-825.550.

Birks, Cedric G. Swaging dies. Re. 31,084, Cl. 72-416.000.

Chevron Research Company: *See*—
Adamson, John S., Re. 31,089, Cl. 340-825.550.

Grasselli, Robert K.; Suresh, Dev D.; and Milberger, Ernest C., to Standard Oil Company. Process for the manufacture of unsaturated aldehydes and acids from the corresponding olefins. Re. 31,088, Cl. 562-535.000.

Greenwald, Harry; and Lambiris, Christos, to Kidde, Inc. Coin chute to accommodate various coin slides having differently sized coins and coin combinations. Re. 31,085, Cl. 194-1.00G.

Johnson, Edward M., Jr.; and Stone, John T., to W. R. Grace & Co., Cryovac Division. Plastic hinge construction. Re. 31,086, Cl. 220-337.000.

Kidde, Inc.: *See*—
Greenwald, Harry; and Lambiris, Christos, Re. 31,085, Cl. 194-1.00G.

Lambiris, Christos: *See*—
Greenwald, Harry; and Lambiris, Christos, Re. 31,085, Cl. 194-1.00G.

Milberger, Ernest C.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Milberger, Ernest C., Re. 31,088, Cl. 562-535.000.

Minnesota Mining and Manufacturing Company: *See*—
Sohl, William E., Re. 31,087, Cl. 210-671.000.

Sohl, William E., to Minnesota Mining and Manufacturing Company. Method for separating oil from water. Re. 31,087, Cl. 210-671.000.

Standard Oil Company: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Milberger, Ernest C., Re. 31,088, Cl. 562-535.000.

Stone, John T.: *See*—
Johnson, Edward M., Jr.; and Stone, John T., Re. 31,086, Cl. 220-337.000.

Suresh, Dev D.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Milberger, Ernest C., Re. 31,088, Cl. 562-535.000.

W. R. Grace & Co., Cryovac Division: *See*—
Johnson, Edward M., Jr.; and Stone, John T., Re. 31,086, Cl. 220-337.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

BICC Limited: *See*—
Delhees, Peter; and Conlan, John P., B1 4,240,184, Cl. 24—279

Ciba-Geigy Limited: *See*—
Zaffaroni, Alejandro, B1 3,598,122, Cl. 128—268.

Ciba-Geigy Limited: *See*—
Zaffaroni, Alejandro, B1 3,742,951, Cl. 128—268.

Delhees, Peter; and Conlan, John P., to BICC Limited. Pipe and cable clamps. B1 4,240,184, Cl. 24—279.

Zaffaroni, Alejandro, to Ciba-Geigy Limited. Bandage for administering drugs. B1 3,598,122, Cl. 128—268.

Zaffaroni, Alejandro, to Ciba-Geigy Limited. Bandage for controlled release of vasodilators. B1 3,742,951, Cl. 128—268.

LIST OF DESIGN PATENTEES

Aktiebolaget IRO: *See*—
Jacobsson, Kurt A. G.; and Rosenblad, Lars G., 267,010, Cl. D15-78.000.

Akzona Incorporated: *See*—
Gaizauskas, Bronius, 267,006, Cl. D13-24.000.

Alpine Enterprises, Inc.: *See*—
Powell, Clyde W., 266,992, Cl. D10-2.000.

American Commercial Incorporated: *See*—
Everhan, Walter, 266,975, Cl. D7-1.000.
Everhan, Walter, 266,976, Cl. D7-9.000.

American Cyanamid Company: *See*—
Grodin, Adam J., 266,988, Cl. D9-309.000.

American District Telegraph Company: *See*—
Beeson, Kenneth E.; and Thornton, H. Patrick, 266,996, Cl. D10-106.000.

Ancra Corporation: *See*—
Prete, Ernest, Jr., 266,985, Cl. D8-383.000.
Prete, Ernest, Jr., 266,986, Cl. D8-383.000.

Asics Corporation: *See*—
Inohara, Masanobu, 266,966, Cl. D2-309.000.
Inohara, Masanobu, 266,967, Cl. D2-320.000.

Austrian, Jay L.: *See*—
Steiner, Fred S.; and Austrian, Jay L., 266,979, Cl. D8-39.000.

Balmer, James G., to Velo-Bind, Inc. Machine for binding books. 267,018, 11-23-82, Cl. D18-34.000.

Bannwart, Rene: *See*—
Schwab, Jean-Claude; and Bannwart, Rene, 266,994, Cl. D10-39.000.

Bean Station Furniture Factory: *See*—
Wilder, Milton A., 266,973, Cl. D6-62.000.

Beeson, Kenneth E.; and Thornton, H. Patrick, to American District Telegraph Company. Ultrasonic intrusion detector. 266,996, 11-23-82, Cl. D10-106.000.

Bessone, Carlo S.; Roche, William J.; and Sadoski, Tadius T., to GTE Products Corporation. Lamp. 267,046, 11-23-82, Cl. D26-104.000.

Birath, Katarina. Diagram for evaluation of amylase tests. 267,044, 11-23-82, Cl. D24-99.000.

Blaicher, Wolfgang. Combined hydroponic planter, tank and cover therefor. 266,999, 11-23-82, Cl. D11-143.000.

Bolt, Ronald R. Chimney sweep bush. 266,972, 11-23-82, Cl. D4-12.000.

Bonny Products, Inc.: *See*—
Steiner, Fred S.; and Austrian, Jay L., 266,979, Cl. D8-39.000.

Bowser, Jerome. Game board. 267,023, 11-23-82, Cl. D21-23.000.

Brazier, Thomas S. Riding toy. 267,024, 11-23-82, Cl. D21-71.000.

Campion, Stanley F., executor: *See*—
Jensen, George B., deceased; and Campion, Stanley F., executor, 266,977, Cl. D7-20.000.

Casablanca Fan Company, Inc.: *See*—
Dennis, Warren E., 267,005, Cl. D13-23.000.

Chasen, Lee R.: *See*—
Einhorn, Ruediger; and Chasen, Lee R., 267,020, Cl. D19-91.000.

Einhorn, Ruediger; and Chasen, Lee R., 267,021, Cl. D19-91.000.
Einhorn, Ruediger; and Chasen, Lee R., 267,022, Cl. D19-91.000.
Chiou, Suchi. Combined telephone set and microprocessor. 267,007, 11-23-82, Cl. D14-101.000.
Clavel, Raymond, to Hermes Precisa International S.A. Noise abatement cover for typewriter. 267,015, 11-23-82, Cl. D18-12.000.
Clavel, Raymond, to Hermes Precisa International S.A. Noise abatement cover for typewriter. 267,016, 11-23-82, Cl. D18-12.000.
Coats & Clark, Inc.: *See*—
Einhorn, Ruediger; and Chasen, Lee R., 267,020, Cl. D19-91.000.
Einhorn, Ruediger; and Chasen, Lee R., 267,021, Cl. D19-91.000.
Einhorn, Ruediger; and Chasen, Lee R., 267,022, Cl. D19-91.000.
Condon, Richard W.; and Stewart, Charles, to Roper Corporation. Power driven ski vehicle. 267,000, 11-23-82, Cl. D12-7.000.
Continental Group, Inc., The: *See*—
Hasegawa, Gary K.; and Richardson, Donald R., 266,991, Cl. D9-438.000.
Cook, James E., to J. M. Smucker Company, The. Bottle. 266,990, 11-23-82, Cl. D9-389.000.
Corum, Ries, Bannwart & Co.: *See*—
Schwab, Jean-Claude; and Bannwart, Rene, 266,994, Cl. D10-39.000.
David, Melvin J. Support for platelet rotator. 267,040, 11-23-82, Cl. D24-29.000.
Davis, Robert P.: *See*—
Katz, Ira R.; and Davis, Robert P., 266,971, Cl. D3-71.000.
Dennis, Warren E., to Casablanca Fan Company, Inc. Heat sink for a fan motor control. 267,005, 11-23-82, Cl. D13-23.000.
Doi, Keiichiro, to Sharp Corporation. Magnetic card for microwave oven. 267,009, 11-23-82, Cl. D14-117.000.
Dunlop Limited: *See*—
Hart, Claude A., 267,002, Cl. D12-151.000.
Einhorn, Ruediger; and Chasen, Lee R., to Coats & Clark, Inc. Magnetic memo holder. 267,020, 11-23-82, Cl. D19-91.000.
Einhorn, Ruediger; and Chasen, Lee R., to Coats & Clark, Inc. Magnetic memo holder. 267,021, 11-23-82, Cl. D19-91.000.
Einhorn, Ruediger; and Chasen, Lee R., to Coats & Clark, Inc. Magnetic memo holder. 267,022, 11-23-82, Cl. D19-91.000.
Everhan, Walter, to American Commercial Incorporated. Dinner plate. 266,975, 11-23-82, Cl. D7-1.000.
Everhan, Walter, to American Commercial Incorporated. Teacup. 266,976, 11-23-82, Cl. D7-9.000.
Fiinindustriale S.r.l.: *See*—
Vitaloni, Alberto, 267,004, Cl. D13-11.000.
Fortune, William S. Combination solder and strand material dispenser. 266,980, 11-23-82, Cl. D8-14.000.
Gaizauskas, Bronius, to Akzona Incorporated. Electrical connector. 267,006, 11-23-82, Cl. D13-24.000.
Gambro Dialysatoren KG: *See*—
Spranger, Kurt; Heck, Wolfgang; and Nestell, Bengt A., 267,037, Cl. D24-21.000.
Gardisette International AG: *See*—
Stocker, Hans, 267,048, Cl. D47-6.00E.
Goldsmith, Bruce, to Space Odyssey Ltd. Physiological display panel. 267,019, 11-23-82, Cl. D19-62.000.
Goshi Kaisha Kanemitsu Doko Yosetsu-sho: *See*—
Kanemitsu, Yukio, 266,982, Cl. D8-360.000.
Kanemitsu, Yukio, 266,983, Cl. D8-360.000.
Kanemitsu, Yukio, 266,984, Cl. D8-360.000.
Grodin, Adam J., to American Cyanamid Company. Decanter. 266,988, 11-23-82, Cl. D9-309.000.
GTE Products Corporation: *See*—
Bessone, Carlo S.; Roche, William J.; and Sadoski, Tadius T., 267,046, Cl. D26-104.000.
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ISSUED NOVEMBER 23, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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